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MINING AND SCIENTIFIC PRESS.

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VOL. LXI.—Number 1. DEWEY & CO., PUBLISHERS. SAN FRANCISCO, SATURDAY, JULY 5, 1890. Three Dollars per Annum. Single Copies, 10 Cts.

Hinkle's Ore Feeder.

Philip Hinkle of this city recently obtained through the MINING AND SCIENTIFIC PRESS Patent Agency a patent on an improved ore feeder, an engraving of which is shown herewith.

The chute or discharge opening at the lower end of the ore-hopper is made preferably of cast-iron, and so secured as to relieve the lower end of the hopper itself from wear, obviating the necessity of replacing the entire hopper, by reason of its lower end wearing out from the friction of the passing ore. The feeding tray is so made that the falling tappet of the stamp mill will cause a backward movement of this feeding tray. It can also be arranged to feed roller-mills.

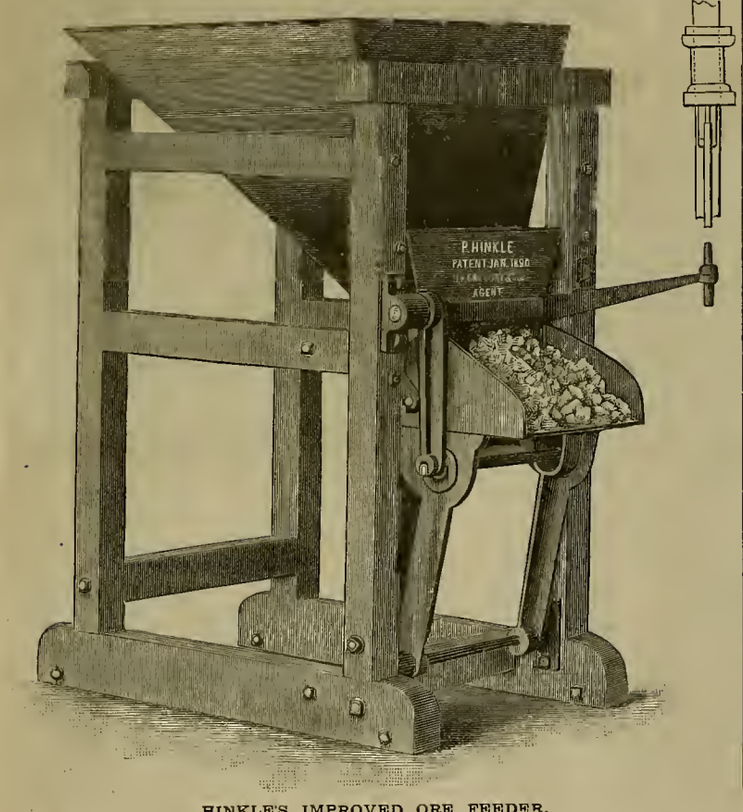
Ore placed in the hopper will fill it and a portion will flow out through the mouth upon the tray, and when, by the swinging or oscillation of the tray it moves forward, another portion of the ore will move out upon the tray. When the tray has again moved backward, a transverse bar prevents the ore moving backward and will force it forward a short distance upon the tray, depending upon the amount of oscillation which is given to the tray, this being subject to regulation at will.

The next forward movement of the tray carries this body of ore forward with it and allows another small portion of the ore to flow out of the hopper; and when the front portion of the ore has reached the front edge of the tray by these successive movements, it will be gradually caused to fall off and drop into the crushing apparatus of whatever description may be employed.

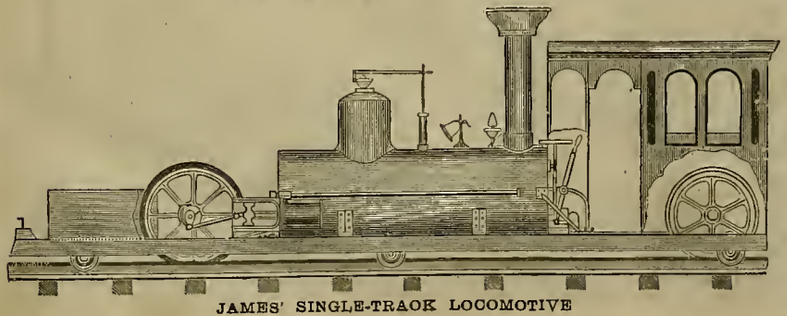
The amount of movement of the tray is regulated by a rod passing through a fixed plate. By screwing certain adjusting nuts on the rod one way or the other, the tray will be drawn back or allowed to fall forward, and thus the amount of motion which is given will be regulated. A removable steel plate is fixed to the tray below the bar to take the wear. When the eccentric is used to actuate the tray, the movement of the latter will be a positive one and dependent upon the throw of the eccentric; but if the tray is to be used on a stamp-mill, as described, the weight of the tray and the ore upon it in front of the fulcrum will cause it to move forward promptly by gravitation as soon as released from the power which draws it back.

The loosely fixed bar which acts as a stop and pusher upon the tray, being made of steel will be subjected to little or no wear, and will always lie closely upon the tray, so as to prevent any escapes of ore to the rear. It can also be readily removed and replaced at any time.

The advantage of the tray supported from below is that moving about a fulcrum-point, which is below the tray, the tray moves in a small convex arc of a circle, which is more conducive to its prompt return after having been forced back, and also produces a better result in feeding. H. P. Gregory & Co. are the Pacific Coast agents for this improved feeder.



HINKLE'S IMPROVED ORE FEEDER.

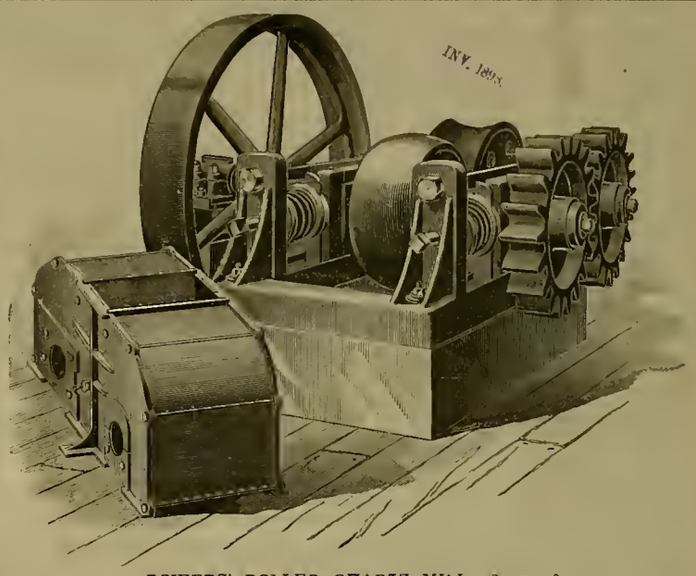


JAMES' SINGLE-TRACK LOCOMOTIVE

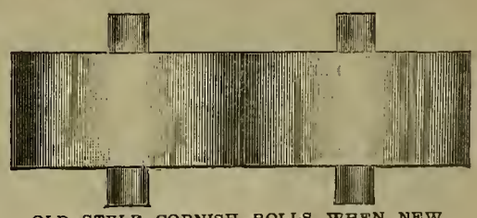
A Single-Track Locomotive.

Last week we gave a brief account of the James engine for traction purposes, which was tested on a small section of track in this city. On this page is a cut of this "single-track locomotive," which was built for Mr. James by Mr. Milchner at H. W. Rice's shop on Bluxome street. It is 24 feet long and six feet wide. The pair of cylinders 8x16 are connected with a drive-wheel 30 inches in diameter. The other wheel is 24 inches in diameter, and both are 30 inches wide, with the flanges in the centers and run upon two pieces of timber for rails 4x12 fastened upon ties two feet between centers and four feet long. The engine is provided with a 25 horse power boiler and reverse gear complete.

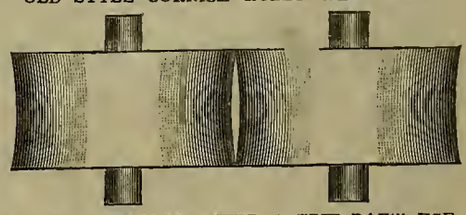
The object of this invention is to furnish a cheap system of transportation to localities where the traffic would not pay either a narrow or a broad-gauge railway. Under favorable conditions, it is claimed this railway can be constructed for $1000 per mile. The profits that this system of road would make would all be consumed in paying interest on either a broad or narrow gauge.



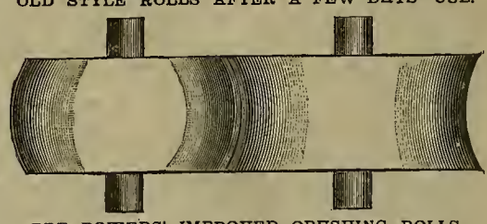
BOWERS' ROLLER QUARTZ MILL.—See page 9.



OLD STYLE CORNISH ROLLS WHEN NEW.



OLD STYLE ROLLS AFTER A FEW DAYS' USE.



THE BOWERS' IMPROVED CRUSHING ROLLS.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Mines of El Dorado County.

[From our Traveling Correspondent.]

El Dorado county at this time is an inviting field for the mining operator. The "mother lode" passes through the county, and in its great length affords scope for operations on an extensive scale. The Old Church Union and other mines have proven beyond all doubt that the veins are permanent and high in gold values. At this time the working properties are situated both on and off the mother lode. From Plymouth to Placerville the mines are on a vein running parallel with the mother lode, but situated a mile to the west. By some this vein is considered a fork or feeder of the mother lode. Some geologists contend that the whole mile in width is part of the mother lode, inasmuch as the mother-lode walls are found on the west of this vein. The mother lode proper is not worked at any point on this section.

Near El Dorado and about midway to Shingle Springs is a contact between the serpentine and common slate. This has been prospected at one point by the Greenstone and the ore found to carry tellurides. Accompanying the mother lode to the west is a large porphyry dyke filled with quartz seams carrying heavy gold. From this dyke large amounts have been extracted by hydraulicking off the surface as at Greenwood, and by pocket miners. This porphyry belt runs from 50 to 300 feet in width and crops all the way across the county. At present the most heavily mineralized portion near the walls is being milled at the Shaw mine, and the entire dyke at the Dalmatia at Kelsey. Various estimates have been placed on the milling value of the dyke. Senator George Hearst is reported to have put the entire body at $3 a ton.

Going north from Placerville, the mother lode continues to fork as at El Dorado and at Garden Valley. The porphyry is the foot-wall of one group of mines and the hanging-wall of another parallel group. There does not seem to be any marked difference in the value of the two. In the Grizzly Flat district the mines are in the granite belt, and may be said to correspond to those of Soulsbyville, Tuolumne county, and West Point, Calaveras. Arnle, they are very high in grade. Drifting on old river channels is being pursued with the best results, and this branch has never had as bright an outlook as at the present time. I think it will be found that the mother lode and the accompanying veins increase in their mineral wealth as they go north, and it may be that in gold, as in silver, the altitude will affect the value of the veins.

El Dorado.

The Oakland, formerly known as the McNulty, is now being developed by Supt. R. S. Ran, who was formerly superintendent of the Sutro tunnel. The mine is opened by crosscut tunnel that cuts the vein 150 feet deep. From this point a shaft has been put down 300 feet on the vein which averages 4½ feet in width. The ore milled from this vein in 1875 went from $15 to $20 a ton. The mine has a complete 10-stamp mill. It is Mr. Ran's intention to sink 300 feet deeper on the vein and drift. If then the shoot is of sufficient length, the mill will be enlarged and the property put in first-class shape for extensive and economical working. The mine is on the west branch of the mother lode and two miles south of the Old Church Union.

Central.

This mine is situated midway between the Church and Oakland, and is the property of Rix & Firth of S. F. A tunnel 250 feet long crosscuts the two veins, 200 feet deep. The vein where they are crosscut shows two and 15 feet in width. The owners have just had a trial crushing of the ore made at the Oakland mill and its value will determine the working of the mine. Mr. B. E. Carter is in charge as superintendent.

The Church Union.

This plant has been dismantled and nothing but the buildings remain to tell of its former value. The history of the mine is good, and serves to stimulate the owners of other locations on the same vein. The name of the mine was changed to the Springfield, but is better known as the Old Church mine that turned out the yellow metal so freely in days gone by.

The Church Mine.

This mine joins the Old Church Union on the north. The mine was formerly known as the El Dorado until Mr. Church came into possession and organized the Church Gold Mining Co. The similarity of name has led many to suppose that this and the Old Church Union were the same. The Church was opened in the '50's and a large amount of gold extracted from the surface rock. The property then lay idle until 1886, when a shaft was put down to 400 feet. In 1887 a three-compartment vertical shaft was sunk to 650 feet and a crosscut of 80 feet run east to the vein, which is here 11 feet wide. The last 6000 tons of ore milled from the mine gave an average of $18 36 a ton. The present mill is of 10 stamps and three Frues. Mr. James Richards, formerly of the Clipper Gap Iron Works, is Supt. The property is owned by T. R. Church (president), Baker & Hamilton, W. W. Montague and J. H. Neff.

The Equator

Is half a mile south of the Church. A tunnel has been driven 1300 feet, crosscutting five ledges, running from 12 to 60 feet in width, 500 feet deep. On each vein a drift has been run 100 feet. The ores have been tested and by millruns give from $8 to $15 a ton. A 40-stamp mill will be erected within the next three months. The property is owned by Minneapolis capitalists; E. B. Burdick, formerly of the Great Sierra of Tioga District, is superintendent.

The Shaw.

This property is west of the other mines and on the dyke. The Shaw was worked in the early days for the pockets alone. Mr. D. M. Morgan took hold of the mine and put a shaft down 136 feet on the east wall of the 140 feet of mineralized dyke or Seam mine. A Huntington mill has been put up and the property will be in full operation soon. Mr. George Hearst is reported as placing the entire 140 feet as a $3 proposition.

The Greenstone.

This mine was formerly known as the Barnes mine. The vein is a contact, and the ore runs high in tellurides. The property is situated west of El Dorado and is operated by Placerville people. At present the mine is idle, but will resume operations soon.

The Pacific.

The main shaft has been put down 800 feet, showing a vein 21 feet in width. The superintendent, Mr. R. Rowalinds, is now preparing to sink an additional 400 feet. The mill is idle at this time. The mine overlooks the city of Placerville and is almost in the city.

The Gentle Annie.

The five-stamp mill is dropping and will soon be increased to ten. The mine is on the mother lode and is situated 1½ miles north of Placerville. The vein is opened by a drift on the vein, 350 feet long. A crosscut of 80 feet has been driven on the vein without reaching the wall. The ore carries five per cent of sulphurets running from $50 to $80 a ton. The ore mills, with sulphurets included, $4 a ton. Another crosscut tunnel cuts four veins of 2, 10, 18 and 12 feet widths. By shafts and cuts the pay on the main lode is proven to be from 10 to 30 feet in width throughout the entire length of the mine. Mr. J. B G. Parlow is superintendent.

The True Con. M. & M. Co.

On the mother lode at Placerville this company is driving a drift on the vein to cut a shoot that produced $300,000. They are now in 2000 feet and will cut the pay shoot 700 feet deep.

Big Tunnel M. Co.

This tunnel is now in 585 feet and is intended to crosscut several hundred feet on the mother lode. The company has already crosscut a large body of very fine slate for roofing purposes. A Boston company has now taken hold of the property and will put it on its feet.

Gravel Mines.

The Rodgers mine on Smith's Flat, the property of Col. W. K. Rodgers of Sonoma, is in very rich gravel at this time. The pay is on a bench on the east side of the channels. The pay is 150 feet wide and runs from two to three feet in depth. A small piece of cement no larger than a guinea egg yielded $14 in gold, and another lump of dirt weighing about 10 pounds gave $20 in gold. These were pieces of gravel handed Mr. Rodgers by the miners, on the day of my visit, while he was passing through the workings. Gold can be seen all through the gravel. The superintendent, Mr. D. N. Coffin, put the average value of the gravel at $5 a car of 1000 pounds. The gold brings $20 an ounce.

The Linden cement gravel mine of Smith's Flat is also running.

The Cedar Ravine cement gravel mine is running ten stamps. The other gravel mines here closed on account of surplus water, but will soon be in operation. Mr. Landaer is driving a long tunnel to tap the extreme bottom of the channel.

Grizzly Flat.

The Morey mine is running 10 stamps on $40 ore. The Mt. Pleasant is being put in shape and will soon be reopened.

The Pleasant Valley mine with a shaft 230 feet deep, on a vein from three to six feet of ore running from $13 to $15, is not being worked. This is the property of Mr. H.S. Morey of Placerville. The vein carries a large percentage of sulphurets which go as high as $200 a ton.

Roofing Slate.

El Dorado is fast building up a reputation for the value of her roofing slates. The mines have not been able to keep up with the demand.

The Chill Bar Slate Company is located three miles north of Placerville, on the south bank of the South Fork of the American river, Messrs. Motherson & Perine proprietors. The slate is opened by two benches. The lower has a face 75 feet deep and 100 feet wide. The upper bench is just started. When these benches are run 1300 feet the quarry will have a face of 700 feet. The slate will be worked in 40-foot benches. The property consists of 40 acres. At present the owners are turning out 150 squares a month, one square representing a space 10 feet square on the finished roof. The slate brings $7 a square delivered at Placerville. The quality of the slate is of the best. The quarry has furnished the slate for the Berkeley Deaf and Dumb Asylum, Insane Asylum at Napa, and large amounts for the use of the S. P. R. R.

The California Slate Co. property parallels the Chili Bar. The property is being opened by Mr. E. Bird, the superintendent. The property is owned by the American Bridge Co. The mine is shipping 150 squares a month, but will soon be in shape to turn out double that quantity. The face is 200 feet wide and the property 900 acres in extent. The company furnished the slate for the Stockton courthouse and supply the S. P. R. R. Co. with a large amount. I will give you more from this county next week. E. H. SCHAEFFLE.

Mines and Prospects Around Shoup, Idaho.

EDITORS PRESS: — Considering the short period since the mines in this district were first discovered, and the amount of gold bullion they have since produced, together with their present isolation and the prospect of a railroad coming through here in the near future, a brief description of their development and surface indications may be of interests to the mining public.

This camp is situated on the Salmon river in Lemhi Co., Idaho, about 45 miles below Salmon City and 125 miles from Butte, Montana. The principal feature of this district is the Kentuck mine, which is the property of the "Kentuck Mining Co." of Salt Lake. This vein was first discovered in 1883, and has since produced, according to reliable authority, $500,000 in gold, and is developed to a depth of 800 feet on the dip of the vein. The present owners paid $17,000 for the property when there was no development on it excepting two small open cuts, but it showed a strong vein of rich free ore from the start. They first developed it 100 feet deep by running a short adit tunnel and drifting both ways on the lead; then they built a one-stamp mill and two arasta heds on Boulder creek, 1½ miles distant from the mine. By sorting the ore they made it work by this process, $50 per ton, and took out enough money to pay the first cost of the mine and develop it to a depth of 300 feet; then they built a complete ten-stamp free gold mill, which is also run by water-power, using about 200 inches, under a 90-foot head, on a five-foot Pelton wheel.

This mill has run continuously for five years, working the ore just as it comes out of the lead without sorting. It is a hard white quartz that averages about $12 per ton in free gold, and also carries a good per cent of rich concentrates. There are immense reserves of ore in sight and the company contemplate building a 60-stamp mill this summer, right below the mine, so as to save the cost of hauling the ore. The vein is a fissure with a northeast and southwest course, and dips with the hill toward the southeast at an angle of 45 degrees. The formation is "gneiss" with a predominance of coarse feldspar and black mica arranged in horizontal layers, which gives it a wavy, laminated appearance. There is also a succession of large dykes of birdseye porphyry and hard blue-black syenite running through the country, two of which cut the vein, causing a fault of 20 feet in one and 50 in the other. The mine is developed by tunnels driven into the lead, about 150 feet apart, one below the other, which are all connected by drifts and raises. There are two main chutes of ore called the East and West. The East chute does not come to the surface and was discovered while hunting for the West one after a fault. They both increase in lateral extent as depth is attained, and on the lower levels come together, forming one continuous body of ore for 700 feet in length, with good ore still in the face of the southwest drift. The vein on the lower level will average ten feet thick, which has been thoroughly tested by stoping out a month's run at different places the full width of the lead, which was found to yield a handsome profit. It is just 3000 feet from the croppings of the mine down to the river, on the surface, and by keeping in a gulch which runs straight down, it would have an average grade of about 35 degrees, and as the lead has a pitch of 45 degrees square toward the river, it would not require a very long tunnel to tap this lead at a depth of about 2000 feet on the dip. About 100 yards below this tunnel site, the Salmon river has a fall of five feet in a hundred, which could be made to furnish very cheap power. The company owns 12 full claims, all connected, three of which are patented, and all show more or less quartz at the surface. With so much ore in sight and such natural advantages for development, and the gold rapidly gaining in fineness as depth is attained, it is safe to predict that this mine will be producing bullion a generation hence. About a quarter of a mile east of the Kentuck is

The Grunter Mine,

Which was fully described in these columns last March, so it will not be necessary to give it in detail again, but to give an idea of its productiveness it might not be out of place to state that one miner alone this spring broke and wheeled a short distance from an open cut on this mine, 300 tons of quartz in just three months. Said rock is being milled at the present time and averaging $10 per ton in free gold.

The Speculation Mine

Is about 1000 feet south of the Grunter mine, running parallel. It is a two-foot vein of the same character of ore, developed by a 40-foot shaft and two short tunnels. There is an arastra connected with this mine which has a 24-foot hurdy-gurdy wheel and a 12-foot bed. It has produced considerable ore that averaged $40.

North of the Grunter, about one mile, is located the Gold Crest and Monolith claims, both on the same vein, which crops out a long distance from two to four feet thick. It is developed by short tunnels run on the vein, and has produced several hundred tons of ore, which was worked in an arastra right below the mine, and run all the way from $20 to $100 per ton.

Clipper and Bullion.

On the opposite side of the river and about the same altitude as the Kentuck are the Clipper and Bullion claims. This was a blind lead, and was discovered two years ago. It has about the same course and dip as the Kentuck, but being on the opposite side of the canyon, dips into the hill; yet it is very steep quite a way below the mine, and it would not take a very long adit tunnel to cut it a good depth. It is developed by two levels run on the lead, which are connected by a winze and short adit tunnels, and show a well-defined vein of free-milling honeycombed quartz, about 300 feet in length, 120 feet deep in the vein and from 18 inches to 3 feet thick.

One hundred and fifty tons taken from the upper level of this mine averaged $64 per ton in a custom-mill. The owner, Mr. Eli Suydam, is at the present time erecting a Kendal mill with a capacity of six tons in 24 hours, to work his own ore.

About one mile south of the last named mine and on the waters of Pine creek, there is

A Group of Claims

Owned by the Pine Creek Mining Co., a Philadelphia organization. There is a 10 stamp quartz-mill run by water-power, a steam sawmill, and a whole lot of mismanagement connected with this property. The principal vein is a true fissure, 2 feet wide, that works about $18 per ton in free gold, and carries some very high-grade sulphurets. If it was developed a little further and properly managed, it ought to pay a handsome profit, but the property is lying idle at the present time.

The Lexington and Virginia

Veins are located two miles farther up this creek. One is three feet and the other 10 feet wide, developed to a depth of about 50 feet. The smallest vein is said to average $40 per ton in free gold; the other is low grade. There is a one-stamp mill in connection with this property which has pounded out over $20,000.

Copper Glance.

On leaving Pine creek the formation changes to a metamorphic slate. After climbing up a steep gulch to the south, we come to the Beaver creek divide. There, at an altitude of 6500 feet, in a burnt-up slaty formation which is very much threaded with veinlets of white quartz, there is a claim located called the Copper Glance. It is a brick red and brown porous quartz that shows a few grains of native copper in the pan. It crops out at intervals for 1000 feet. In the center of the claim there is a cut run into the vein which shows it to be about 8 feet thick. There are about 10 tons of ore piled on the dump from this cut, which is a black massive silicate of copper, with cores and streaks of purer metal. The whole pile is said to average 30 per cent, but it is easy to sort out soft pieces of copper glance that will run 80 per cent; it also carries both gold and silver to the value of $20.

It is about three miles from this mine southwest to the

Big Creek Hot Springs.

These springs come to the surface in the bed of a deep gulch, in a granite formation. The gulch is dry for two miles from its head; then there is a small spring of ice-cold water flowing about six miner's inches, and 100 yards below are the hot springs, 15 in number, which have an aggregate flow of about 40 inches. They are all clustered together on about half an acre of ground and the water in some of them is intensely hot. It will boil most anything put into it. One of these springs bubbles up in the bottom of a small cavern, which is formed by the sediment accumulations from two springs above it and just about big enough for a man to stand in. The walls are encrusted with beautiful mineral tints of green, pink and yellow, and from the cavities issue gentle puffs of steam with clock-work regularity.

A Failure.

About two miles below the springs where the water enters Big Creek, there is a camp called Dynamo, after a defunct Arc Light plant, which is the property of the Beaver Head Hydraulic Co. This is another example of rank mismanagement, and an eyesore to a creek that was never given half a show to prove its value.

This company was organized in Albany, N. Y., by some New York stock-jobbers, who, of course, undertook to run the works themselves in place of hiring a competent engineer. The consequence was they spent $150,000 and accomplished absolutely nothing. All the bars and points along this creek carry coarse gold, some of which has been worked by drifting and

rocking, and paid from $3 to $5 a day to the man; and there is a tributary putting in about 10 miles above the works which has produced $12 000,000 in placer gold since 1867.

About five miles south of Dynamo there is a lead vein located, called

The Henrietta.

It is 18 inches thick of solid, high-grade galena that melts readily in a camp-fire, but it is low grade in silver. The formation is a micaceous, slaty rock, very much stained up with red oxide of iron and looks very favorable for mineral. It is three miles below Dynamo to where the main creek enters the river at a point eight miles below Shoup; and a little farther down on the opposite side Owl creek puts in. Near the mouth of this creek there is a claim called the Paymaster. This is a vein of white quartz in a granite formation, which crops out for a thousand feet in length from three to four feet wide. There is a shaft down 10 feet, which shows some very pretty specimens of black sulphurets of silver and specks of native gold.

Traveling Through a Basin Country.

Which is studded with millions of feet of the finest pine and red fir timber a man could wish to see, at the head of the East Fork, we come to a prospect called the Esmeralda. This is a ten-foot vein of fine-looking red and brown honeycombed quartz, that pans well in free gold. There is a 20-foot shaft down, and an average sample across the bottom of it assayed $23 in gold and silver.

The Orr group of claims are situated about four miles north of the Esmeralda. There has been considerable work done on this property, which shows some large veins carrying massive, fine-grained pyrites of iron and copper, and some galena and antimony which is said to be very rich in silver.

About six miles east of here, on the headwaters of Spring creek and near the main divide of the Bitter Root range there is

A Camp Called Lentville.

There are about 30 claims altogether, which are large veins of concentrating ore, from 10 to 50 feet thick. The principal one is called the Lent mine, and is developed by about 200 feet of tunnel run on the lead. The ore is a mixture of copper pyrite, galena and antimony, with considerable specks of gray copper. It is said to assay from $20 to $2000 in silver, and is owned by a Missoula company. It is eight miles from the Lent mine to the mouth of the creek, where it enters the river two miles above Shoup, on both sides of which are located several prospects of minor note. The formation is granite and porphyry and the ores most base copper and silver, but some of them show a little black sulphorets of silver.

This district might be said to be constructed on an angle of 45 degrees, but it is well watered and heavily timbered, has a big variety of minerals and formations, with a stretch of country for 100 miles north and west, which has hardly been looked into. With the developing stimulus the "Midland Pacific" railroad will bring, it is destined to play an important part in assisting the embryo State of Idaho to forge ahead to that enviable position in the production of precious and useful metals of which her energetic neighbors now boast.

Shoup, Idaho. R. BELL.

Ophir District, Placer County.

[From Our Own Correspondent.]

At Ophir the Hathaway is dropping 20 stamps on $8.50 ore. The concentrates are saved by the Woodbury concentrator, which, after a competitive trial with another prominent machine, was given the preference. I was promised the full particulars of the test, but it has not been forthcoming. Suffice it that Messrs. Valentine gave their order for the Woodbury machine, after a thorough trial of the Victor, Gorrier, Frue and Woodbury. The shaft in the mine is now down 250 feet on a 2½ foot vein in granite. Mr. G. T. Taylor, formerly of the Kennedy mine, Amador county, is now superintendent. The property is owned and operated by the Valentine Bros.

The Eclipse mine is proving a bonanza to the fortunate owners. Each day sees richer bodies of ore exposed. Should they continue, the mine will "eclipse" anything in the State. The mine is opened to a depth of 300 feet by shaft, with levels run 225 feet. The vein runs from 2 to 4 feet in width. The veins cut the country rock at an angle of 45 degrees, cross-cutting granite, porphyry and slate. The ore runs from silver to free gold, but on the average contains one-third silver and two-thirds gold in its values. The mine has now ten stamps, but will soon be equipped with ten additional stamps. Mr. C. A. Poage is the fortunate president, with Mr. J. B. Patterson (an aspirant for the position of Governor of the State) as superintendent. If Mr. Patterson can succeed as well in his gubernatorial aspirations as he has in mining, he bids fair to eclipse his numerous competitors. Ophir has a bright prospect, and this once abandoned camp bids fair to outstrip her early prosperity. I did not get into the other mining sections of the county, so cannot now give any description of their present prosperity. E. H. SCHAEFFLE.

ALL the leading mines on the Comstock lode are looking well, all having in sight an amount of ore sufficient to cause their several superintendents to feel quite at ease as regards supplies for milling.

The Gold Belt of Northern California.

Ancient River Channels and Gravel Deposits.

NUMBER IV.

[Written for the MINING AND SCIENTIFIC PRESS by JAMES M. TALBOTT, Shady Run, Placer Co.]

The first point where there is any evidence of the existence of these conditions is observed on the ridge southeast of Auburn. Here is a considerable deposit of lava. Whether or not it covers an ancient or modern channel, it is about on a line with the course of the lava flow down the Forest Hill ridge. The upper foothill section appears to form something of a terrace or bench between the "ditrns" and gold belts and is about 20 miles wide, distinguished by low rolling hills, little valleys and small canyons, and its utter barrenness of gold diggings between the main rivers.

There are a few quartz ledges that carry gold; there is not a vestige of live; no ancient channel nor gravel deposits; no ravine or canyon diggings that ever paid grub, within its bounds, outside the rivers. All the mining in this section has been confined to the bars and benches along the rivers and in the river-beds, where some very rich claims have been worked. The bedrock formation is apparently the same in the three sections. In the lower foothills are rich quartz ledges and some rich gravel deposits; in the gold belt section, rich channels and gravel deposits.

Some of these peculiarities may be accounted for, but some "scientific guss" will have to explain why there are no gold diggings in this intervening section.

The topography of the country indicates that the

Ancient River of the Forest Hill Ridge

Passed through a deep narrow gorge and made a sharp bend to the southward, in the vicinity of Spring Garden, about where it left the gold belt and entered into the upper foothill section. The channel is partially filled with the cement and debris from the mud flow, and perhaps a portion of lava, when an excessive and long-continued flow of lava set in and completely blocked up the channel and formed a permanent dam in this narrow gorge. This excessive lava flow, then, is the prime cause that puts in active operation all of the other agencies involved in the great change. The water was diverted into some lateral canyon or large tributary, free from lava. Here, then, commenced the erosions in the gold belt, that scooped and cut out the modern basins and channels and filled them up with bowlders, gravel and gold, from the ancient channel; detritus, pipeclay and all kinds of material from the surrounding country. The first effects of this method of modern channel erosion and gravel deposits are observed on the south side of the ridge about Spring Garden and at Todd's Valley. Here is an extensive gravel deposit in a modern channel or basin. After this was formed, a flow of lava blocked up the outlet and further filled up the ridge. Then a similar break occurred on the north rim and cut out a modern channel, and formed the gravel deposits at Yankee Jim's and Brushy Canyon, and thus, by this method of alternating lava flow and floods, the ancient channel was filled up and the modern ones cut out and filled up in like manner, as the lava filled the ridge. Where the conditions were favorable, gravel deposits were formed. Along the south side of the ridge the deposits about Forest Hill, Bath, Volcano and Michigan Bluff were formed by this same method. Above Michigan Bluff the ancient channel crosses through to the north side of the ridge, where it is blocked up to above the Brimstone Planes. The indications are that

The Lava then Ceased to Flow

For a long period of time — a period long enough for the floods to cut out a modern channel down the Iowa Hill ridge and form the extensive gravel deposits along that ridge, and carry down the millions of gold found in them and the adjacent rich canyons. When the flow again set in and this channel was blocked up and capped with lava, we can account for the wash not being so heavy and extensive on this ridge as on the Forest Hill, by the displaced waters of the main tributaries finding an outlet around the lava dam on the Middle Fork side into some lateral tributary unobstructed with lava, running on about the same course of the present Middle Fork. The vantage for the erosion of this modern river is obvious, when we consider the change of level occasioned by the subsidence in the valley sections, which largely increased the grade, an important condition of erosion. From the course of the

Ancient Channels Through the Gold Belt

To the southwest, it is evident their gravels were dumped along the lower foothill section in the vicinity of Auburn, Newcastle, Ophir and the surrounding country, until the waters were diverted into some modern eroded channel. It is possible that the channel was blocked by the lava just above Auburn and the waters displaced into the present river, where, at the junction of the North and Middle Forks, the river makes a short bend to the south and has cut out a channel several hundred feet lower than the old one. From this point the modern erosions have followed the course of the ancient channels through the upper foothill section to the lava dams in the gold belt, which will account for the absence of any channel or gravel deposits in this section. The

Effects of the Deep Modern Erosions

Are manifest all along this section by the high, abrupt hills on either side the river, and the numerous extensive benches and bars, with a deposit of 50 feet of bowlders and gravel, high above the present river. The conditions of erosion here established continue throughout all time, and extend from the low valley section to the volcanic region of the Sierras, in the mountain section. In regard to this extensive region, lying between the gold belt and the summit, the indications are that the deep erosions of the present rivers through the gold belt have given the mountain section the steep grades that carried away the principal portion of the large tributaries of the ancient river and deposited their contents in the numerous modern canyons. It is a well-known fact that all the mining done above Town. R. 12 E. (the gold belt) is confined to remnants of small channels—in some instances capped with lava—and in the numerous large canyons of this section. The

Facts Obtained From Actual Workings

And the present topography of the country indicate that the Pliocene river of the Middle Fork divide—like the present rivers—had tributaries running from the north, east and south; that they drained all the country now drained by the Middle Fork, some portions of the North Fork and possibly portions of the South Fork; and that they made their debouch from the mountain section, in the upper portion of the gold belt, thereby forming one grand river, whose channel received the gold brought down, by the steep grades, from the section above.

The foregoing detail of facts shows conclusively that all of the

Agencies Were in Active Operation

At the same time. The volcanoes of the Sierras furnished the lava that dammed up the ancient rivers and displaced their waters. The vast subsidence in the valley section at the same time gave the vantage for erosion. This great change was not sudden, but must have endured for centuries of time. Neither was it local, for the same conditions are observed throughout the whole western slope of the Sierras for 300 miles or more.

Had it not been for this excessive lava flow, we would have no ancient channels 2000 feet above the modern rivers, the modern erosions would have followed those channels, the same as in the upper foothill section, and the miners of to-day would be delving in the deep mountain gorges for this same gold that they are now taking out through long and expensive tunnels under those lava-capped ridges. In regard to

The Modern Gravel Deposits,

The fact of the channels of the two main ridges uniting above the Brimstone Planes indicates a common source, and the fact that there is not a gravel deposit on the divide but what can be traced directly under or to the lava capping, which shows conclusively that all the deposits between the North and Middle Forks not only have a common source, but form an independent system. I have been thus definite in outlining this theory on the Middle Fork divide, to show that it is in harmony with developed facts, and accounts for the varying conditions. If it is correct as to this divide, why not on other lava-capped divides of similar formation and like conditions?

The North Fork Divide.

If the Middle Fork divide contains an independent Pliocene channel and system of gravel deposits, as herein described, I propose to show by the same line of indications and facts that the North Fork divide contains a similar one. This divide embraces the country lying between the North Fork and the South Yuba river, and is almost the exact counterpart of the Middle Fork divide in general outline and topography, differing slightly in detail. Bear river separates it into two prominent ridges in the same way that Shirt-tail canyon separates the Middle Fork divide. The country between the South Yuba and Bear river is the Nevada Ridge; that between the North Fork and Bear river I will term the Shady Run Ridge.

[If no new ideas are advanced in this article, I will introduce some new names.]

Mr. Bowman is the best authority on this subject that I have ever read. In regard to what I call the Shady Run Ridge, in the C. P. R. R. Survey, he says: "You will follow in your walk a mountain crest as continuous and regular on top as a railroad embankment. It is the volcanic divide or capping; an ancient mud and lava flow that filled up the extinct rivers' bed, which gave it direction, covering in and sealing up within the bedrock rims the accumulated Pliocene gravels, and displacing the water into the new channel of the present time, the yawning gap of the North Fork of American river 2000 feet beneath your feet."

Mr. Bowman gives us no idea of the course or extent of the extinct rivers' bed that gave the mud and lava flow direction.

There is not a lava-capped ridge in the State where the conditions are as favorable for tracing the course and extent of the Pliocene river channel, with the same degree of certainty, by the surface indications, as this one. The C. P. R. R. excavations along the rimrock, nearly the entire length on one side where the mud (or cement) and lava are seen inside the rim rock every mile or so. On the other side, Towle's narrow-gauge road and the Gold Run branch of the South Yuba ditch, where the same conditions are observed, though not so prominent. Following a modern method, we will select a commission, composed of some eminent geologist and noted mining experts, to investigate the facts and

Observe the Conditions.

If too lazy to walk, which is generally the case with commissions, we will board the train at Towles and sketch an outline of the facts and conditions from the platform of a car on the overland flyer.

This is about on the lower edge of the great serpentine belt. Just after starting up, the geologist will notice the natural appearance of the bedrock in the cut on the north side of Canyon creek. On the south side we pass through two short cuts of the same formation. He will particularly note that the changed condition denotes the effects of extreme heat from a heavy deposit of lava on the point above, a few hundred feet to the east. This fact has not been noted in this connection heretofore. The mining experts will observe that this is the north rim of the Pliocene channel. About half a mile to the south we cross through the ridge in an open cement cut. Here the rim-lava and a portion of the cement has been carried away on either side by the modern erosions. Running alongside of this cement about half a mile, we come on to the south rimrock just below rock cut. From here the track winds around and cuts through high bedrock points for about two miles. Within this distance the cement, capped with lava, is observed in several places some distance back from and high above the road. At one of these places the cement was quarried out for building culverts under the railroad.

As we move along you will notice a projecting point of bedrock 300 feet above the track, where the road leaves the river bluffs and curves around to the north just below Shady Run. On passing through two or three low bedrock cuts, we come on to an extensive flat formed by big slides from the ridge. The road curves around the upper side of this flat for about a mile and a half. The flat extends from the ridge about half a mile on to the bluffs of Bine canyon. The rimrock along here has been carried away for from 50 to 200 feet, and in one or two narrow breaks 350 feet below the railroad. Here, at an altitude of 4150 feet, is the nicest place and finest climate in the mountains. No finer apples, pears, plums and cherries are grown in the State.

As we approach the station at Shady Run, you will observe the cement crops out above the road in a small ravine near the railroad woodshed. This body of cement is more than 200 feet thick, and extends through the ridge under the lava cap to Canyon creek. We are right at the station now, and are passing over a tunnel run in the cement 200 feet perpendicular below the track. I will refer to this tunnel hereafter. About three-fourths of a mile above the station, at the upper end of the big flat, the road curves to the northward and strikes into the most wonderful section on the whole line. The most acute observing geologist or mining expert, looking at the tall pines, the scrubby oaks and underbrush that covered these rugged points, would not have a remote idea of the true conditions, as revealed by the railroad cuts 100 feet beneath the surface. Within the brief limits of one-half mile here, we can read the history of events as they transpired thousands of years ago, and define the method. In the first cut you can see in a measure

The Extent of the Mud Flow.

By looking down to the right 100 feet or more, over a cliff of this mud cement, you can see the rimrock. About 20 feet above the track, on the upper side, the lava cap comes on to the cement. The line of junction is as prominent as if made by a painter's brush.

A few hundred feet farther up, the road curves through a steep, narrow point in a cut about 75 feet deep. No description of the deposit in this cut can give a correct idea of it. The banks on either side resemble the ruins of a tumble-down piece of huge masonry, built of masses of float bedrock; big, rough, angular bowlders, filled in around with all kinds of smaller rock and all cemented together with lava. The bottom deposit in the next cut, a short distance above, is of the same material, put together in the same way. About midway of this cut is a deposit of 20 feet of small, smooth-washed bowlders—cobbles, gravel and sand, with a few rotten granite bowlders, five feet in diameter; showing evidently the action of water from a granite wash. On top of this granite deposit has come another lava flow, and a big rush composed of the same kind of material as that underlying it. At the upper end of this cut you will *notice particularly* a low sag in the ridge. There is where the Cedar Creek ditch runs in a tunnel cut through the lava cap and dumps the water into Canyon creek, where Towle's narrow gauge-road runs about on a level with the C. P. R. R., not more than half a mile distant.

Here we make a sharp curve to the east and soon enter a short cut, where the rimrock shows 20 feet above the track on the right. On the left from the level of the track it pitches abruptly back under the ridge. The deposit in this cut is composed of an irregular confused mass of all kinds of material found in the ridge. Large masses of lava imbedded in and covered over with big, smooth washed bowlders, gravel, sand, slickens and large-sized, round water-worn cobbles as can be found on any modern river bar.

(*To be Continued.*)

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alameda.

COAL.—Livermore *Herald*, June 26: There are now employed at the Eureka Coal mine 18 miners, 12 shovelers, four mule-drivers, four dumpers and utility men, one blacksmith, three carpenters, one engineer, one fireman, three teamsters, and a superintendent. Total, 48. There are also a few substitutes. The schedule of wages paid is as follows: shift foremen, $3.50 per day; miners, $3 per day; shovelers and others, $2.50 per day. The miners work in three shifts of eight hours each; all the other men in ten-hour shifts. The pay-roll amounts to nearly $4000 a month. The work is now continued without intermission, day and night, and Sundays as well as week days, in all three of the tunnels. Excellent progress is being made,

Calaveras.

WEST POINT.—Cor. Calaveras *Chronicle*, June 28: The chlorination works are making a run on the Blazing Star sulphurets. The Hurley and other mines are all reported as working steady and doing well. Fred Greve, owner of the Black Wonder mine, is taking out some good ore which keeps three teams hauling steady to his mill.

Fresno.

AROUND HILDRETH.—Mariposa *Gazette*, June 28: The mining region around Hildreth is again active. Prospecting is going on vigorously throughout the entire neighborhood, although two of the large mines, the Abbey and the Hildreth, are permanently closed. Green Hitchcock has bonded the Morrow mine. The Wilson, which assays $1500 to the ton, is not running at present, but arrangements are being made to open it permanently. If sufficient capital was expended on the numerous veins and locations in this vicinity a handsome interest would be returned and good times would soon be assured us, but most of the mines are owned by men of small means who cannot expend enough to enable them to reap much benefit from their labors. The Zebra, which, under the efficient superintendency of Mr. Brett, made such fine clean-ups last summer, is again doing well under Supt. J. Rodgers, lately from San Jose. The mill is running night and day, crushing 16 tons of ore daily Thirty men are employed, and should the present bright outlook continue, twice that number will be given work. The company are jubilant over the prospect of golden linings to their pockets, and the whole neighborhood is rejoicing and having a share of the prosperity.

Mono.

AT BODIE.—Lundy *Index*, June 26: Supt. Macey will thoroughly test the proposition of working Bodie low-grade ores, of which immense quantities are obtainable. If he succeeds in milling them at a profit, it will be necessary to handle them on an extensive scale, and keep in operation all the available crushing apparatus in the vicinity. This one problem satisfactorily solved at the old Standard, it may fairly be presumed that the Noondays will be reopened and made to give up something from the vast ledges of low-grade quartz known to exist in them, and other mines will follow suit, there being a dozen places in the district where material may be found that can be made to pay, if the Standard experiment is successful. This will necessitate the employment of a large number of men, and the camp will be lively once more.

Nevada.

MEADOW LAKE MINING DISTRICT. — Sierra City *Tribune*, June 25: Parties here who are interested in Meadow Lake (Nevada county) mines report that the snow will not be off up there before the first of August. Considerable work was done there last season. The Keystone Mining Co., composed of Sacramento and San Francisco parties, had miners running their tunnel ahead on contract during the winter. A number of practical miners of this place, who have been operating up in that district, have great faith in the mines there, and are confident that they will ultimately be successfully worked. The gold is undoubtedly there, they say, and one of these days the genius of man will discover a way to save it.

RICH ROCK IN THE PEABODY.—Grass Valley *Union*, July 1: Yesterday evening Superintendent Tilley brought to town some beautiful specimens of quartz that had been struck during the day in the shaft of the Peabody mine. The gold showed among delicate quartz crystallizations, and one piece of wall rock was shown which had a narrow band of quartz running through it that was studded with gold. Beside the specimen gold in different pieces of quartz, the gold was seen mixed with sulphurets. The specimens attracted much attention, as they were the handsomest that have been taken out in the district for some time. They were taken out in sinking the shaft, which is now at a depth of 215 feet, and it is the first time that gold-bearing quartz was ever found in the shaft. The ledge is showing nearly four feet in size. This rich find is very encouraging for the future of the Peabody, and shows that Gold Hill yet retains its old-time riches.

HUDSON MINE.—Grass Valley *Union*, June 29: The Hudson mine, located on the banks of Deer creek, near the old Hudson House, said mine used to be called the Scandinavian, has been idle for the past week on account of the burning out of a boiler. Yesterday, however, work was resumed. During the stoppage water rose to a considerable hight in the shaft, but it will be but a few days before the shaft is pumped out and the work of sinking resumed. There is a San Francisco company operating the mine, and developments recently made gives them every encouragement to go ahead with the work.

THE IDAHO NEW LEDGE.—*Tidings*, June 25: Ten stamps are running on the ore from the large new ledge in the 1700-foot level of the Idaho and the returns are up to the average of Idaho ore. No idea of the extent of the chimney, or deposit, has been gained. The workmen in the drift are now engaged on a raise. Mr. John Coleman informs us that the incline is to be given greater depth, indications warranting the belief that when this is done the bottom of the shaft will not be far from the new ledge, provided the discovery proves to be a ledge and not a mere chimney, something that can be better passed upon a year hence than now. It may be that it is a chimney—one of immense proportions.

MANHATTAN MINE TO BE REOPENED.—Grass Valley *Tidings*, June 30: Thursday of this week teamsters will commence hauling machinery to the Manhattan mine, just above and adjoining the Pittsburg and near the famous Sneath & Clay mine, in Nevada district. A. S. F. company represented by M. L. Elliott will conduct the operations. The machinery has been obtained from John M. Thomas and others, and workmen to-day commenced to take it off the Roach claim, two miles below Grass Valley, and arrange in lots for transportation. It is of power sufficient to enable workings to the depth of 800 or 1000 feet. Although in Nevada district, the Manhattan ledge is not in the characteristic granite formation, but in slate, as in this district, and the ore is free milling. The mine is 300 feet in depth and the ledge from two to four feet in size, yielding from $10 to $40 per ton. It was shut down less than 20 years ago, the company losing heavily because of the destruction of the works twice by suction by fire. The present company will utilize water for power, being but 2000 feet distant from the South Yuba Company's upper ditch and 190 feet below its level.

GOOD PROSPECTS AT THE MENLO.—In the Wisconsin incline of the Menlo property now being operated by a syndicate under hood, Mr. E. A. Wiltse, superintendent, a two-foot ledge was cut Friday at a depth of 72 feet. The ore is highly mineralized and shows gold freely and is all pay rock. The management expected to find a ledge at about the point where the discovery was made, but that ore of such evidently good grade would be uncovered was unexpected. It is undoubtedly the shoot worked in 1857 and 1858, when high-grade ore was extracted. The Homeward Bound shaft, on the same property, has been cleaned out, placed in good repair and sinking inaugurated.

ENCOURAGEMENT AT THE LAFAYETTE.—The ore from the 18-inch to 24-inch ledge in the face of the Lafayette tunnel is of such encouraging appearance that the management has resolved to go back and run a drift that will give additional backs of 300 feet. Considerable ore has been extracted and a crushing will soon be made. Operations on the Ben Franklin in the hands of the same company, a Chicago syndicate, have been delayed by the molders' strike in San Francisco, necessitating the casting of machinery in this city in addition to that originally arranged for.

OPERATIONS ON THE SEVEN-THIRTY.—Messrs. Rawling, McLachlan & Co. are making good progress down on the Seven-Thirty ground, Deadman's Flat. They have put down, with a windlass, an incline through the old works a depth of about 90 feet. The ledge will be found at a depth of about 120 feet, and water is now to be contended with.

San Diego.

JULIAN DISTRICT.—Cor. San Diego *Sun*, June 27: The Owens mine is situated in the town of Julian, and has been worked for a number of years. The mine for some time past has done little to speak of, and the pump getting out of order the shaft was allowed to fill with water. But with all its setbacks, brighter times are beginning to dawn on the owners. The new Cornish pump has arrived and is being placed in position, and will be ready for use in two or three days. It has a capacity of 25,000 gallons per hour. The main shaft is down 400 feet, with a rich body of ore at the bottom, in fact, the stuff is rich at all the openings. Nick Campbell is foreman of the Owens.

BLUE HILL.—The management has just finished cleaning out the top level, which will give them stoping ground for 300-feet, and will be used as an air shaft for the lower level, where some of the richest ore ever taken out of a mine is to be seen.

HELVETIA.—The brothers of Ex-Governor Bartlett were the first owners of this property. In former days it was looked upon as one of the best paying mines in the district. The present management has sunk a new shaft and struck very good pay rock and a good body of it. A number of veins concentrating at the bottom of the shaft constitute a formidable breaster of ore. At present the company is cleaning and timbering the old shaft and when this work is finished a drift will be run intersecting the new works.

THE HIGH PEAK MINE. — This property is owned by Ferguson, Garland and Mark, and is an old-worked mine, but for the last few years little work to speak of has been done. Until recently the property was bonded to Barnett & Co., of San Diego. This company is running two shifts and driving the lower level with all possible speed, the top level being in some 400 feet. In this level there is a body of ore fully three feet in bulk the character of which is remarkably nice and I have but little doubt that it will assay all the way from $8 to $14 to the ton when the lower level is in the required distance. Stoping and sinking will be the order of the day.

THE EAGLE.—This is owned by Crays and Mallock. These gentlemen have rested on their oars for some time, Uncle Mallock being ill, work had to be suspended, but the present prospect is more cheering, and active work will be resumed on the Eagle.

THE VAN WERT MINE.—This property is owned by Ferguson and Wilson, and is a real good little mine, with very rich rock in sight and a large proportion of it carrying free gold. The Oak Grove and Genevieve mines are owned by Pete Hanson and Walch Hanson. The latter is one of the most experienced miners in camp and has resided here for a great many years.

Shasta.

CALUMET.—Redding *Free Press*, June 28: The south fork flume of the Spring creek ditch, which furnishes power for the Calumet works and which is 220 feet long and 40 feet high, was rebuilt in 11 days, with water turned through. The stamp-mills of the Calumet Co., also the two dry-mills working the Paul dry amalgamating process, are all running. They expect to fire up their furnace after the 1st. Charles Thistlewait and Frank Cunningham are at work on their tunnel opposite Middle Creek station. They have a three-foot ledge, and the quartz shows up splendid. Work on the Eureka tellurium mine is progressing. Philip Scherer was recently elected secretary of the company. The mines on Squaw creek were never in a more promising condition. There are above 100 men at work, and the mills are turning out lots of bullion. The Uncle Sam and the Reilly mines particularly are paying big. The rock in the Sky Blue mine looks better as depth is attained. Some of it is bespattered with gold. This is a rich mine. J. H. Beecher of Anderson was up looking at his mine near B. Swasey's ranch this week. He has 50 tons of ore at the Atkins Reductions Works from which he expects good returns.

Sierra.

THE MOUNTAIN MINE.—Sierra *Tribune*, June 29: Everything is bustle and activity at the Mountain mine. Down on the bank of the North Yuba river, where the grading for the 40-stamp mill is about completed, the big boarding-house is well under head way and will soon be ready to occupy. A large force of men have been put on the road and flume, and the contractors propose to push it through in the time allotted to them. The contract to build the wire-rope tramway has been let to the Trenton, New Jersey, Iron Co. Parties will arrive here before long to inaugurate that work. Sixteen men are employed up at the mine, and everything is being put in shape for such time as the mill is ready to start up, which it is expected will be during the month of October.

ANOTHER GOOD MINE THE VICTIM.—The Alaska Mill and Mining Co., which operated the Alaska mine at Pike City, this county, has applied to the Superior Court of San Francisco for a dissolution of the corporation, which was formed Dec. 1, 1861, with a capital of $10,000,000 in 100,000 shares. The Alaska has always been a good mine and has yielded enough gold to have given handsome profits to the stockholders, if it had been operated upon business principles. Like many other companies who have operated in this county in the past, the Alaska was the victim of its own foolish and extravagant management.

MINING SALE CONCLUDED.—The sale of the Chips quartz mine at this place to San Francisco parties has been completed by the payment of the purchase price, $16 000, over to John Henderson, who was owner of the property. The Chips is regarded here by those who have had opportunities for knowing as being a good mine. The 10-stamp mill is to start up in a few weeks.

Trinity.

CANON CREEK MINES.—Trinity *Journal*, June 28: Last week we made mention of the striking of the ledge in the Bailey mine on Canon creek. The tunnel in which they struck it taps the ledge at a depth of 175 feet. The ledge is 7 feet wide, carries free gold and is rich enough to make any man wish he had an interest in it. It will probably average not less than $40 to $60 per ton, and about half of the ledge is much richer. They are running the tunnel to tap the other ledge, which they expect to strike at a depth of about 275 feet. If this is found as good as the one already tapped, there will be enough ore in sight for a 40-stamp mill. The owners of the Fisher Gulch mine are sinking a shaft on the ledge to the depth of 50 feet. They are now down 25 feet and the ledge looks well. If at the depth of 50 feet the ledge shows up well the owners will put up an arastra and give the ore a working test as the mine is being prospected. They have already begun the construction of a ditch to divert the water from the gulch. The mine, if it proves to be one, is so located that it can be worked cheaply and very conveniently. The latest strike in this district is the McGinty, found last week by Zack Weyand and Dave Thye, in which W. D. Everhart and Chris Meckel of this place are interested. The ledge is about a foot wide, between good walls, and the rock is estimated to go $75 to the ton. The company has another location called Sunday Morning, which prospects well. Work on both of the locations is now being done, and without doubt the company will develop a rich mine. There are several very rich prospects in that district and some of them are under process of development. If they turn out reasonably well according to present indications the Canon creek will be the richest camp in the county in one or two years.

NEVADA.

Washoe District.

ANDES.—Virginia *Enterprise*, June 28: The 420 level north drift from No. 2 west crosscut extended 45 feet, formation quartz and porphyry. On 350 level west crosscut extended to 289 feet; formation porphyry, with seams of quartz.

SIERRA NEVADA.—The west crosscut from the southwest drift on the 630 level is still being advanced in a mixture of porphyry and clay.

BELCHER.—The No. 3 west crosscut from the 200 No. 2 south drift was advanced 24 feet, making its total length 39 feet, and struck the wall at that point. No. 3 east crosscut, opposite it, is out 15 feet, the face in a mixture of quartz and porphyry. The 200 north drift from No. 3 east crosscut is out 42 feet, in low-grade quartz. Have completed timbering the 850 east crosscut and started a west crosscut opposite it, which is out 32 feet in a mixture of clay and porphyry. The 1300 east crosscut has been extended 24 feet, making its total length 136 feet. The face is in soft ground, showing streaks of quartz.

UNION CON.—East crosscut No. 1 on the 1466 level is still being advanced in porphyry and clay.

SAVAGE.—On the 300 level, east crosscut No. 2 from the south drift was advanced 29 feet in vein porphyry. On the 1300 the north drift is advanced 68 feet, and continues in the good ore mentioned last week. During the week milled 455 tons of ore; average battery assay, $20.17. Have bullion on hand amounting to about $20,000.

OCCIDENTAL CON.—Continue to extract gold of good quality from the stopes on the 400 and 450 levels. In the 550 level north line west crosscut the winze is down in a mixture of quartz and porphyry. The 650 level is finding quartz that carries some metal.

IMPERIAL.—The joint Confidence, Challenge and Imperial west crosscut No. 2, on the 1000 level, is out 140 feet, 20 feet having been made during the week. The face is in quartz giving low assays.

CON. CAL. & VIRGINIA.—Are extracting the usual amount of ore from the 1300 and 1500 levels. The raise along the west wall on the 1435 level continues to show some metal. A considerable amount of ore is being extracted on the 1650 level. The usual amount of ore will be shipped to the mills this week, and the average battery assays will be about as heretofore.

CROWN POINT.—The winze from the 160 east crosscut has connected with top of 300 south stope, and shows overhanging clay at point of connection that threatens to cut off the pay ore at that point. Shipped to the mill during the week 809 tons, 1730 pounds of ore, the average battery assay value of which was $17.03 per ton.

NORTH OCCIDENTAL.—Work still confined to repairs.

POTOSI.—The winze below the 930 level is still in ore of a good milling grade. The ore is about five feet in width and shows much strength. All the experts who have examined the development are well pleased with its appearance.

CHOLLAR.—On the 750 level good ore is being mined in No. 1 crosscut. No. 3 crosscut is still showing well as regards formation. Good headway is making in the north lateral drift on the 900 level.

SEG. BELCHER.—The 1000 raise from the No. 1 east crosscut is up 109 feet, having advanced 27 feet during the week. The top is in low-grade quartz. Have completed the timbering of the joint 850 east crosscut, and have started a west crosscut opposite it, which is now out 32 feet, the face being a mixture of clay and porphyry.

HALE & NORCROSS.—Are working on the 500, 800, 1250, 1300 and other levels. At several points low-grade ore is showing, and some of these are likely to lead to paying deposits. A good deal of ore is being mined on the 1300 level The usual amount of ore is being reduced at the Nevada mill—about 1100 tons a week. The ore averages $20 a ton. There is bullion on hand and at the mill amounting to $48,567.

SILVER HILL —The east drift on the 1600 level is being advanced in a favorable formation.

NEW YORK CON.—The usual prospecting operations are being carried on, principally on the 650, 800 and 900 levels.

ALPHA —The usual exploring work is being done on the 500 and 600 levels.

GOULD & CURRY.—On the 400 level the northwest drift has been extended 18 feet; total length, 153 feet. Formation, soft porphyry. All work on the 625 level for the past week has been confined to repairing west crosscut No. 1.

BEST & BELCHER.—On the 1000 level joint west crosscut No. 1 has been extended 18 feet; total length, 412 feet. Formation, hard porphyry. On the 1200 level west crosscut No. 1 has been extended 15 feet; total length, 51 feet. Formation, clay and soft porphyry.

JUSTICE.—Work is in progress at the usual points, and the ore breasts continue to look well. Are milling about 150 tons a week, the average assays of which are nearly $34.

ALTA.—The ore breasts on the 900 level are still looking and yielding well. The mill is kept running to its full capacity on ore that averages $22 a ton.

SCORPION.—The southwest drift on the 630 level still continues in vein porphyry and clay.

YELLOW JACKET.—The yield of ore is sufficient to keep the Brunswick mill constantly employed. The average of the battery assays is about $20 a ton.

MEXICAN.—West crosscut No. 5, on the 1465 level, is now penetrating softer ground, but porphyry continues to be the prevailing rock.

CHALLENGE CON.—The joint Challenge-Confidence west crosscut No. 2, from the 700 north drift (500 Yellow Jacket level) is out 234 feet, 24 feet having been made during the week, face showing porphyry. The joint Confidence and Challenge west crosscut from the top of the raise on the same level is out 80 feet, 5 feet having been added, the face in porphyry. This crosscut has been stopped for the present, and from its extreme west end a joint Confidence and Challenge south drift has been started, which is in 13 feet, the face showing low-grade quartz.

OPHIR.—The 1300 level winze continues in quartz that carries some metal.

UTAH.—The incline raise on the 72 level is still in a mixture of porphyry and quartz.

Eureka District.

BULLION SHIPMENT.—Eureka *Sentinel* June 28: Last Friday Wells, Fargo & Co. shipped 12 bars of Eureka Con. bullion, valued at $30,300.

ORE SHIPMENTS.—During the past week the Eureka and Palisade railroad shipped 580 tons of ore to the Salt Lake smelters.

Osceola District.

GRAVEL MINING.—Salt Lake *Tribune*, June 28: When asked by a *Tribune* reporter about Osceola, Prof. Maynard gave some interesting particulars of the operations of the Osceola Gravel Co., of which he is manager. The one ditch originally planned and built by the company did not furnish ample water, and it was proposed to construct another ditch and flume to bring water from another and larger stream. Prof. Maynard among his friends in New York raised over $150,000 for the purpose, and during the past year work has been going steadily onward in construction. A canal has been dug and fully flumed 18¼ miles to carry 2500 inches water. Last week water was running through the first 10 miles, to where there is a break to be flumed, and below that water was in three and a half miles more of the canal. By July 1st the fluming will have been completed, and the three hydraulic monitors will be throwing streams on the gravel banks. Two monitors have been running for some time by the old ditch, doing good work. These monitors are among the largest used, part of them having 7½ inch nozzles and the others 8½-inch nozzles. Work is continuous day and night. The company has a 4000-candle power electric light plant to aid in night work. No clean-ups will be made till the end of the season. Some of the boxes required a little changing, and in making the changes a small amount of gold was taken out and shipped. The company has good reasons to feel confident of excellent results in its operations.

Plochs District.

EXAMINING MINES.—Salt Lake *Tribune*, June 28: Prof. Maynard says that Mr. Godbe, the promoter of this enterprise, was considered an enthusiast; that he had known him for a number of years, and what had always been a puzzle about the mines at Ploche was that if so good as represented, it was singular that the companies should shut down as they did when there was so much ore in the mines. Regardless this feature he had, upon investigation, found that the cause of the collapse of mining in Ploche was not because there was no ore, but had come about through the jeal-

ousies and animosities of the companies. The professor went on to say that after spending a week examining the Julia mine from the 800-foot level down to the 1300-foot level, and was not half through, he was ready to say that Mr. Godbe in telling of the property had not told one-tenth. He will return and finish the examination of the Yuba and then make an examination of the other mines there for the purpose of furnishing a full report to the company in New York. He has only passed through the other mines, without examining them critically, but felt fully prepared to make the statement of his surprise and that without a railroad it was impossible to ship ore, but that with a railroad came the possibilities of Pioche being an immense mining camp. One furnace is running at the smelter under the management of Mr. Werner, formerly of the Germania, and Prof. Maynard was sure that it was doing as good work as any furnace in the land. This furnace reduces 50 tons of ore per day.

Tuscarora District.

GRAND PRIZE.—*Times-Review*, June 27: Three hundred and four hundred foot level stopes on the old east and west vein are yielding the usual quantity and quality of concentrating ore. Four hundred foot level winze stopes continue to produce a good grade of concentrating ore, and some high-grade ore, which is being sacked for shipment. Concentrator running steadily; crushed during the past week 500 tons.

NORTH BELLE ISLE.—The stopes above the 300 level are without material change. Left-hand drift from the north gangway, 500-foot level, extended 20 feet; the face is all in vein, showing a great deal of spar.

DEL MONTE.—First level—North gangway has been advanced 16 feet, showing some water and spar. North drift from No. 2 east crosscut advanced 15 feet, face of drift not looking so well; ore is low-grade. Raise from No. 1 east crosscut up 9 feet.

BELLE ISLE.—Upraise from the south drift from North Belle Isle line crosscut, 350-foot level, extended 5 feet, showing a large amount of very high-grade ore.

NORTH COMMONWEALTH.—Third level—Joint raise up 47 feet; progress for the week, 30 feet. Raise in south drift is up 13 feet, following good ore. Line crosscut between Commonwealth and North Commonwealth extended 22 feet. Joint raise on same line up 95 feet, progress 33 feet.

COMMONWEALTH.—Second level—Raise from No. 2 east crosscut has been put up 18 feet, cutting through two feet of good ore, assays from same $220 per ton. The chutes are being put in, and the raise carried up to the first level before drifting on the ore. It will take about five days to complete the work. Work in the stopes progressing favorably; 140 tons of ore hoisted, assay value $23 per ton.

ARIZONA.

ORE AND CONCENTRATES.—Prescott *Journal-Miner*, June 26: A large pack train arrived yesterday with ore and concentrates from the Crowned King mine in the Bradsbaw mountains. The lessee of the Silver Prince and Black Warrior, in the Bradshaw mountains, is taking out rich ore, and has an abundance of it in sight. He expects to start up the Tuscumbia mill shortly on ore from these mines. W. M. Claypool of the Sampling works reports pretty heavy receipts of ore there for the past two months. Miners can get the money for their ore within a few hours after its delivery, which is a great convenience to them. Martin Lewis, the Colorado mining man, who recently purchased a mill from Chas. A. Girdler, has moved it out on the Hassayampa, where it will be used for working ore from mining property recently purchased by the former. Dr. Vickers says that the Congress camp now contains about 400 people, and he claims that it is the most beautiful mining camp on the continent. Three shafts are being sunk on the mine at different points, and a new boist is being put up to continue the main shaft to a greater depth. J. N. Rodenburg says that Jacob Henkle has one of the best opened up mines in the county for the amount of work done. He has between 600 and 800 feet of development, which has been done to the very best advantage to the property. A crosscut run to the ledge cut it at a depth of 1200 to 1500 feet below the surface, making the future working of the mine easy and at the very smallest cost. The ledge shows good ore at every point. There is not a property in the Territory which is more promising for the amount of work done.

BRITISH COLUMBIA.

BONDED FOR FIFTY THOUSAND DOLLARS.—Nelson *Miner*, June 27: The negotiations that have for the past few weeks been carried on between the owners of the Queen Victoria copper claim, Messrs. Brown, Becker and Burr, and several of the Canadian Pacific officials, have at last been concluded satisfactory to all concerned. The claim has been bonded for $50,000 for six months.

TOO EARLY TO PROSPECT SUCCESSFULLY.—A. H. Kidsdale and Bob Wynearls came in on Sunday from a three weeks' prospecting trip down the lake. They report the country difficult to get over, owing to the creeks being high and the timber unburnt. They found several large but barren ledges, countless millions of mosquitoes, plenty of fish, and had bad weather. They have concluded it is a little too early to prospect that section of country, and are camped up at the Narrows.

TEN STAMPS. DROPPING ON POORMAN ORE.—Situated on the right bank of Eagle creek, about a mile from the Kootenay and 300 yards from the Nelson-Sproat trail, the 10-stamp mill on the Poorman mine, owned by the Eagle Creek Gold Mining Co., does not at first sight present a very imposing appearance, but it is very picturesque. The stamps and all the necessary adjuncts for treating the ore are by no means such as belong to early days. They are of the newest and most approved patterns of milling machinery. The power which drives the machinery is obtained from the waters of the creek. About 200 inches of water are flumed a distance of 1000 feet, and this, acting on a Pelton wheel, runs the entire mill with perfect satisfaction. Except the original outlay in flumes, pipes, etc., the cost of the motive power is practically nothing. The ore is obtained from the Poorman mine, about a quarter mile up the hill, and is very rich. Crosscuts have been run so that about 5000 tons of ore are now blocked out ready for stoping. But seven men are at work in the mine at present, as there are about 800 tons of ore on the dump. The regular cleanup has not yet been made; but this district is no longer virgin, as already the first infant bar of bullion has been shipped from this mill. The property is owned by Charles Hussey of Spokane Falls and A. L. Davenport of Portland, who are very well satisfied with the results so far. It is managed by R. B. Huntley.

COLORADO.

READY TO SHIP.—Georgetown *Courier*, June 28: It is said that there is in the neighborhood of 600 tons of ore awaiting shipment at the Commonwealth mine in East Argentine. Hank Beighley has taken the contract to transport the ore, and the way it is being taken out, it will keep four or five teams busy all summer in removing it.

WORK HAS BEEN SUSPENDED for the present at sinking the Centennial shaft, which is down 512 feet and shows a four-foot vein of mineral at the bottom. Work will be confined to running levels. Sinking has been necessarily slow this spring on account of the immense amount of water to contend with.

THE HALL TUNNEL is in between 2200 and 2300 feet. Bad air has prevented rapid work for some time, but this will, in a measure be obviated soon by the extension of the air-box to the breast of the tunnel. Mr. Hall contemplates putting a large drill hole down from the surface some 1500 feet, which will give excellent ventilation for all time. Work had to be suspended at drifting on the veins cut on account of bad air.

IN the lower workings of the Bellevue lode there is a splendid body of ore. The vein is about 18 inches thick, 7 of which is solid. The remainder is streaked throughout. It is claimed that it will mill over 1000 ounces to the ton. In and around that section matters have been very quiet for a long time. Now that this strike has been made a renewal of the once active mining in that locality is assured.

THE MONTE CRISTO.—Aspen *Times*, June 28: Work is being vigorously pushed on the Monte Cristo up Maroon creek. Since the recent discovery, the company is encouraged to believe they will soon be able to put the mine in a paying condition. They are running now to make a connection for air, and when this is completed all of their force will be put to work taking out mineral. Working assays that were brought down yesterday returned about 100 ounces per ton, and Mr. Pelland, who is in charge of the mine, believes that as much as 10 tons per day of this character of mineral can be taken out and shipped.

DAKOTA.

THE BABY SMELTER.—Deadwood *Pioneer*, June 26: Dr. Carpenter was tickled all over yesterday at the excellent manner in which his little pet smelter worked. She was fired up early in the morning and ran cleverly and satisfactorily all day long. Mr. Carpenter is only running about one-half the pressure he did before shutting down several weeks ago, and is elated over his success. Pyritic smelting, he says, is bound to be the proper and paying mode in the future. Some few changes have been made in the machinery since reopening, but were only done for the purpose of making the work more convenient for the workmen.

THE ROASTERS RELINED.—At the reduction works this morning two newly relined roasters will be put in operation. The works has only been running one barrel for the last week, but will after today be able to handle all the ore that comes in. A number of new improvements have been put in this plant recently, enabling them to do very rapid and satisfactory work. Forty-eight hours after the raw material is dumped at the works, it has reached the finishing touch.

TIN.—John Christenson, who is building a number of hoisting-engine houses for the Harney Peak Tin Co., is enthusiastic over the prospects and the amount of tin already developed. The claim over which he is now erecting a hoist has a 130-foot shaft and at the bottom is an eight-foot vein of ore that will average 25 per cent tin.

IDAHO.

THE SMOKY ORES.—Wood River *Times*, June 28: The road to Smoky, which was left in very bad condition by the melting snow, is at last repaired so as to be passable for loaded teams, and hauling will soon begin. Beaton & Rowley's teams have taken a contract to haul in the Carrie Leonard lease ore, and will begin at once. Mr. Jennison has contracted to haul the King of the West ore, and has rigged up an outfit that will haul ten tons per week. He expects to be busy all summer. There is quite a quantity of lease ore at the various other Smoky mines which can now be hauled to market, and which will be coming in from this time on.

MONTANA.

FROM DEWEY'S FLAT.—Butte *Inter-Mountain*, June 28: A representative of the *Inter-Mountain*, who has just returned from a trip to Dewey's Flat, Beaverhead Co., says that camp is in a prosperous condition and the people generally in good spirits. The Jay Hawk M. & M. Co. of Jay Gould is rapidly pushing to completion its ten-stamp mill at that place, and will be ready to commence operations about August. The best machinery obtainable is being placed in this mill, and they fully expect to supply the same from the Pettingale mining property, which they lately purchased. The Lone Pine M. & M. Co., whose mill is also located at this point, is running full force, and pending the completion of the Jay Hawk mill, is crushing the latter's ore.

THE CASTLE DISTRICT.—*Mining Review*, June 28: Great interest is now being manifested in this district, which has long been known as one of the most promising in the State. Nothing but its distance from the railroad has retarded its progress. Now, that it is certain that a railroad will soon be built to Castle, much greater interest is being taken in the district. A number of Colorado miners have secured interests there and are highly pleased with the prospects of the camp. The Cumberland made a strike in the 500-foot level Saturday, and the Princess, owned by Helena parties, is still showing up well. The Yellowstone smelter, which was started Tuesday of last week, as announced in this paper, is producing bullion in considerable quantities, the Yellowstone mine furnishing 50 tons of ore daily, with sufficient ore in sight to continue this daily output for years to come. The increased interest in mining has made business brisk in other lines. It would appear that a mining camp has been started that bids fair to rival Butte in numbers and business.

LOWER CALIFORNIA.

SAN MIGUEL MINES.—*Lower Californian*, June 26: Jos. Williams, superintendent of the San Miguel Mining Co., arrived in town on the 18th inst. from the company's mines 300 miles south of Ensenada. He made the trip on horseback and was 11 days in doing it. The company is working but one mine, which is 60 miles north of Calmalli in a section wonderfully rich in gold and silver, though as Mr. Williams remarked, it has scarcely been touched by the miner's pick owing to the comparative inaccessibility of the region. It is reached most easily by way of Miller's Landing, on the seacoast, whence to the mine it is 24 miles over a good road. The San Miguel Co. have already constructed 40 miles of roads in the vicinity of their property. They have an incline shaft 200 feet deep in the mine and 20 men are at present employed in getting out ore. The ledge is narrow but the ore is rich, and the owners can make a good deal of money out of it. A Bryan mill is on the ground, but it has been idle for some time on account of a lack of necessary machinery, but when that arrives the force of men will be doubled and the output of the mine correspondingly increased. Mr. Williams is enthusiastic regarding the future of San Miguel in a mining way. He believes that it will develop into a very rich section, and that when facilities are established for carrying on the business properly, immense profits will be realized.

A CHANGE IN THE EL PASO COMPANY.—Major George B. Zimpleman is general manager of the El Paso M. Co. no more. If reports now current among mining men are true, he is not even a director in the company. The members of the company in St. Louis have all along been under the impression that the Elsinore mine belonged to the company. At any rate, Major Zimpleman has been working the mine with the company's men and crushing the ore in the company's mill, to the neglect, so it is stated, of the other mines of the corporation. Of course, this was all right so long as the members thought that they were to share in the result of Elsinore's rich yield. But it transpires that at a meeting of the El Paso Co. in St. Louis, Mo., a couple of weeks ago, at which the Major was present, it came to light that the Elsinore was the property of Major Zimpleman, and he surprised his associates by offering to sell it to the company for $50,000, which was only one-half, he said, of what the mine was worth. His proposition was met with exclamations of surprise from the gentlemen present, who believed they already owned the mine, and pointed interrogatories were directed at the Major to explain forwith. He didexplain ,but not to their satisfaction, and the result was that they froze him out and sent Mr. C. J. McLaran out here to take charge of their property.

NEW MEXICO.

A RICH STRIKE.—Silver City *Sentinel*, June 25: John A. Miller made an enormously rich strike in the Pennsylvania mine at Carlisle, last Wednesday. In cutting northward across the ledge, he encountered a large mass of very rich quartz, carrying gold in wire and honey-combed form. On the croppings he discovered a mass of rock running $57 per ton in gold. This mine is in the Carlisle lode, and close by. It was discovered and located the same time as the Carlisle, and was believed by many to be a better mine than the Carlisle was. The strike that Mr. Miller made exceeds in richness anything ever discovered in the Carlisle district. He reports that he has a bond and lease on the Pennsylvania, Center, and Annie mines; some of the owners deny this; also that he has a lease on 20 stamps of the Carlisle mill for six months. The mill is now running.

WEST SIDE CAMP, LONE MOUNTAIN.—Quite a large strike of high-grade ore was made last week in the Good Luck mine, at Westside Camp, Lone Mountain. This is the property of William Beall. The strike improves as development progresses, and promises eventually to assume the proportions of a bonanza. Sweetland & Berry will move into Westside Camp this week, to work the Missouri claim. Bob Redding is working Ed Young's claim, an extension of the Alice. Dan Rose has located a new claim, and christened it the Favorite. He shows up some very good mineral. The Good Luck will ship a carload of ore to Pueblo next week.

OREGON.

AROUND BAKER CITY.—Bedrock *Democrat*, June 26: Mining activity throughout Baker county and in districts tributary to Baker City has not been so manifest thus far this year as usual, the lateness of the spring and the unusual stir in real-estate matters in Baker City combining to detract attention from the hills and gulches wherein lies the great source of wealth of Baker county. But this is at an end and it is plainly apparent that our mines are forging ahead prominently and are taking on their old-time importance. Yesterday the Baisley-Elkhorn, the Robbins-Elkhorn and the Bonanza-Elkhorn mines, 15 miles northwest of the city, were visited by a large party of capitalists. They inspected the workings of the mill plants on the Baisley-Elkhorn and Robbins-Elkhorn mines, examined the ledges and are highly pleased. The Nelson placer mines, west of the city, will yield an immense output this year; so also will the Carpenter and other placers in the same district. At Sanger the C. T. Bradley M. Co. are meeting with great success, and the company's 20-stamp mill is kept in operation constantly, and a monthly output of $20,000 is the result. The mines of Sparta are making a fine showing this year and give assurance that a large amount of capital will be invested in the camp for their development and working. The Dr. Marotte has been sold to Eastern capitalists for $25,000, and the purchasers are making arrangements for a mill plant. The Henderson mines are developing well; the Del Monte group are yielding a large output of ore, and other mines of the camp promise their owners large returns. At Cornucopia the Oregon G. M. Co. are seeing their fondest expectations realized in the wonderful development of the Red Jacket mine, from which is being taken hundreds of tons of high-grade gold ore, which will make that whole section fairly hum with prosperity when the ores are milled and the yield made known to the world. Very recent advices from Cornucopia are to the effect that a second ledge has been cut in the Red Jacket tunnel, the ore from which is extraordinarily rich. The company's 40-stamp mill will soon be in operation. The mines of Mineral City are attracting a great deal of attention, and a large amount of capital is being invested there. The Connor Creek mines continue to send out a large output of bullion to be poured into the coffers of Portland owners. The mines of Burnt river are looking well, and the prospects for the future are flattering. The new reduction process being added to the mill plant of the Eureka and Excelsior Con. G. & S. M. Co., at Cracker Creek, is being constructed as rapidly as possible, and within the next 60 days it may be expected that the camp will take on its former activity and the stockholders in St. Louis begin to realize on their investment. The great La Bellevue mine at Granite, owned by the Cable Bros., is about to be sold to Eastern capitalists for a large sum of money. Work on the 1500-foot tunnel at the Monumental mine progresses with Burleigh drills, and a number of free-gold ledges have been cut, giving favorable signs of future success. The London company, operating the Monumental in the face of a large output of money, are not in the least discouraged and are confident that they will yet realize on their investment. The mines of Greenhorn are attracting great attention, and as fast as the snow disappears mine-owners have resumed development operations. At Robinsonville the mines show favorable and permanent operations will soon be commenced there.

UTAH.

SOLD. — Eureka *Chief*, June 28: We are indebted to B. Christensen for the following information: The Sioux people have purchased the June Bug for $9000; three-fourths interest in the Jessie Knight for $4,00 and one-half interest in the Spy No. 3 for $11,000; $9000 was paid down on the June Bug and Jessie Knight and $1500 on the Spy No. 3. These claims lie near the Sioux group. Shettle & Co., leasers of the Treasure, have secured a lease and bond on the Napoleon, adjoining the Bachman ground. The bond is for $50,000, and some money was paid down. The Napoleon is the property of Condon Bros.

BONDED.—Eureka *Chief*, June 27: R. Thompson, of Colorado, representing Salt Lake capitalists, has secured a working lease and bond on the Mormon Chief and Pride of the Hills, situated about one mile east of Silver City, the property of J. F. Kappes. The bond is for $15,000. A shaft is already sunk 70 feet, and they have some ore, part of which they think will pay. Work has already been commenced, and a whim has been ordered from Denver. R. V. Tone, a miner of long experience in this district, has accepted the position of superintendent.

MCHENRY STRIKE.—Park *Record*, June 28: Contractor Collingwood, under whose direction a force of men are engaged in cleaning out the old McHenry tunnel and drifts, became very much elated last Sunday when a nice vein of ore was uncovered in an old crosscut which had caved in. The property is not yet in shape for active explorations, but as soon as Mr. Collingwood gets through with his job it is presumed that Col. M. Shaughnessy, who has control of the property, will make the McHenry give a good account of itself. The ore lately found assays high in silver and lead, and undoubtedly the find will be developed as soon as practicable.

BEDROCK FLUME AT BINGHAM.—Salt Lake *Tribune*, June 26: Fully fifteen years ago Mr. C. W. Watson began to figure for a bedrock flume in Bingham canyon. Want of means and the death of his partner held him back until about 15 months ago, when he secured the co-operation of Mr. Chandler, and they very soon began the construction of a tunnel. This has been driven over 3000 feet from a point opposite the lead-mill. The tunnel has had the bottom flumed for the purpose of both carrying off the water and saving it, for this enterprise had two objects in view—first to get the gold on the bedrock and secondly to secure pure water for irrigating the lands owned by these gentlemen in the valley, just below the mouth of the canyon. The tunnel has a fall of two inches in 100 feet. Gravel is mined at the upper end and hauled up by machinery through an inclined shaft to be washed. Regarding the quality of the gravel in the portion being worked, it runs from three to four cents per pan. As it is about half boulders, the ground so far opened runs about $1.70 per cubic yard, and is expected to do still better when bedrock is reached. Mining is not being done now because there is too much water. In mining, the gravel will be taken out and the space timbered. This enterprise promises good returns to the fortunate owners. One cleanup was lately made with pretty good returns. Four men are working on the East dump at Bingham, making occasional shipments of ore from the hand jigs. The Winamuck dump (Bingham) has a small force of men operating jigs. A shipment of two cars of concentrates was made last week.

WASHINGTON.

TUNNEL. — Okanogan *Outlook*, June 26: The tunnel on the First Thought is now in 175 feet and progressing at the rate of about five feet a day. H. W. Higley is doing yeoman service in opening up the Lady of the Lake, and the indications are that he will be amply rewarded for his labors. The new hoist is in place and in operation on the Fourth of July, and the work of sinking the double compartment shaft is being vigorously prosecuted. Allan C. Mason has recently had four assays made of Lone Star ore that gave returns of from $43 to $252 per ton, the average being over $100 to the ton. The main shaft on the Lone Star is now down about 350 feet. The ledge at that depth is 6¼ feet wide and plentifully seamed with mineral veins, which are gradually widening out and will soon unite in one solid mass of mineral. Messrs. Lockwood & Taylor returned Thursday from a prospecting trip in the Similikameen district. They discovered some very promising ledges and made one location. They also found placer gold in small quantities, and will return in a few days to prospect the ground more thoroughly.

MECHANICAL PROGRESS.

LUBRICANTS FOR MACHINERY.—A good lubricant is an absolute necessity where friction from bearings is to be overcome, whether in machinery or vehicles. The many kinds in the market invite experiments, which often prove expensive. The cheap axle greases answer where the surfaces are large and where there is ample play, as they are largely constituted of resins which give them a body and hold the cheap greases which form the lubricant; but they are totally unfit for close-fitting bearings. Some fine lubricants are the product of mineral oils, but when purified as they should he they are too expensive for general use. A fine lubricant has been made from cotton-seed oil, but when pure its cost precludes its use in the machine shop; so too castor oil, which when pure is a prime article, is little better than common fat when adulterated, as it too often is. Sperm oil is the best of lubricants for close-fitted surfaces, and where the amount used is small its cost should not serve as a barrier to its use. A good oil which can he prepared by any one with little labor, and which possesses superior qualities as a lubricant for close bearings, can he made of neats-foot oil. Procure perfectly pure neats-foot oil and filter it through a filtering paper placed on a glass funnel. It should be in a room heated to summer heat. Repeat the filtering eight to ten times, the object being, in addition to purifying it, to separate those parts that are likely to oxidize and thicken when the oil is placed in contact with metal. After filtering, the oil should be poured into a tall, thin bottle and stood in a cool place where the light is strong. On being exposed in this way the contents of the bottle will separate; the heavy portion, which will have a granular appearance, will settle to the bottom, leaving on the top a thin limpid oil. Pour this off carefully; if any of the heavy particles have been mixed with the light oil, filter it and then mix with equal weight of benzoline, and it is ready for use. This oil will not thicken and will wear longer than any of the lubricants on the market. It is also very much cheaper than any except the common greases.—*Exchange.*

MANGANESE STEEL.—When Hadfield's manganese-steel was offered to the public it was recognized that, in spite of its remarkable combination of hardness, strength and ductility, a combination in which it excelled all known substances, the difficulty of machining it would be a serious obstacle to its introduction. Partly by special means of grinding with emery, partly by casting in such a way that machining is unnecessary, and partly by other expedients, this obstacle is gradually overcome and manganese-steel is steadily forcing its way into wider and wider use. It is, for instance, used extensively for mine-car wheels and axles, a single establishment having taken over 40,000 wheels and 20,000 axles. It has been found very valuable for the rivets of safes. These rivets are countersunk, so that, if they are to be removed, they must either be drilled out or punched out. In some recent trials by an experienced safe-maker it was found quite impracticable to drill these rivets, when of manganese-steel, even with a powerful steam drill working in the way found most effective for hard-steel rivets. He then tried to punch them with a set and a 20 pound hammer, but in vain. The iron which the rivet held was then nicked and broken, releasing the rivet, which seemed quite uninjured. Other characteristic uses are for dredger-pins and stamp-shoes and dies. In some late trials manganese-steel dredger-pins outlasted four sets of forged carbon-steel pins, and still remained in use; and manganese-steel shoes and dies, in crushing Cornish tin ore, are reported to have lasted from 26 to 59 per cent longer than the maximum life of the best chilled cast-iron, and to have crushed from 33 to 85 per cent more ore.—*Engineering and Mining Journal.*

SHAFTING AND PULLEYS.—The general progress which mechanical engineering has made during the last quarter of a century, remarks London *Engineering*, has affected not only the more imposing class of works, such as bridges, steamships, etc., but also almost every detail of the workshop and factory. Take, for instance, the item of shafting and accessories. Within the period mentioned, shafting, instead of being made of wrought iron, has come to be made of steel in all the newer and higher class factories. The bearings, instead of being rigid, are now usually of the type known as swivel bearings. These not only accommodate themselves to any irregularity in the movement of the shaft, but they are longer than they used to be made, and therefore are more enduring, and they are furnished at the ends with cups to avoid the annoyance of the continual dropping of dirty oil. If lubricated with needle lubricators they require no attention except at long intervals, and there is no liability to run dry. Pulleys, instead of being solid, are now always in halves, so that they can be slacked and shifted, or removed altogether in a very short space of time. The mere screwing together of the two halves is sufficient to fix a pulley to the shaft without the necessity for keys, as was formerly the case, and which so often threw them out of true. As regards very large pulleys, the construction of these of wrought iron or steel by building them up, as it were, has become a large and important business; even fortunes have been made out of the manufacture of them. The first person who advocated and made large wrought-iron pulleys was the late Joseph Rodgers of Leeds; and large quantities of them are still made by his late partners.

MARVELOUS ADVANCEMENT OF THE WORLD'S IRON INTEREST.—Within the last quarter of a century the iron interests of the civilized world have made more progress than any other one interest known to commerce. Formerly all the iron used in the United States was imported from foreign shores, either in pig iron as ballast or in the manufactured article, and so continued until within a recent period; but now the tide has turned. Not only do we supply ourselves, but we are shipping iron to our European neighbors across the big waters! What, may he asked, is the cause for all this vast change? Many things have entered into the list of cause and effect, among which of the greatest moment is the increased price of production in Europe and the indomitable enterprise of our American citizens who have opened and are working hitherto unknown mines with a result heretofore unknown in the iron interests of the world. When Pennsylvania, Ohio, Indiana, Missouri and other States first attempted to utilize their ores, they found they could not compete with Europe on account of her cheap labor and the high prices of labor on this side of the world; consequently the tariff had to be raised in order to give American producers an even chance with the Old World. Now another new era has set in.

AMERICAN FIRE ARMS MADE IN EUROPE.—When the importers of fire-arms came before the Congressional Committee on Ways and Means to ask for a moderate duty on this class of goods, Mr. Walker, member of Congress from Massachusetts, showed that he knew something about arms himself by asserting that the devices of modern guns are American; the most improved modern machinery is American; foreigners have been to this country, copied our models and secured our machinery, and are making the guns now imported to this country from our patterns and machinery, and they are only able to do this by the fact that labor is cheaper in Europe. He added that the average wages paid to gunmakers in Belgium is 50 cents a day, against $2.50 and $3 25 in this country, and presented official statistics showing that there were 117,000 guns imported into the United States last year by reason of this cheap European labor, while only 25,000 were manufactured in this country. No attempt was made to controvert this view of the case.

A MARKET FOR OUR AGRICULTURAL IMPLEMENTS.—Spain presents an excellent market for the introduction of American farm implements, so says our Consul at Cadiz. Referring to the statistics of exports from the United States to Spain for the year ending June 30, 1889, we observe that the value of agricultural implements exported amounted to only $7316, of which about one-half applied to mowers and reapers. This was but a fraction of the total exports to all countries. This does not represent the extent to which American implements are used in Spain, for it appears that many of them are obtained through German, French and English sources, which present more favorable conditions of purchase, in which the system of long credits acts an important part in trade.

THE IRON AND STEEL INSTITUTE OF GREAT BRITAIN will visit the United States next fall. This representative body will probably send over 400 of its members. They will he joined by more than 100 members of the corresponding German society, and will on arrival he taken in charge by the American engineers, and everything that can he done to make their visit a pleasant and memorable one may be anticipated. It is proposed to take the visitors all over the United States and let them see for themselves the giant strides which America is taking in the iron industry. When the visit occurs, much interest will be felt in the reception and proceedings. At present nothing beyond the announcement of the trip is in order.

IMPROVED PUMP VALVES.—In some pumping stations in Germany, pump valves are made tight by grooving the valve seats and inserting rubber cord in the grooves. The cord is compressed when the valves seat themselves, and effectively guards against leakage; in addition to this it prevents the shocks ordinarily produced by rapid closing, and prolongs the life of the seats. The importance of this will be readily appreciated by those familiar with the working of pumps under high-water pressures. When worn, the rubber cord is easily replaced.

THE LIFE OF A STEAM PLANT has lately come up for discussion. For depreciation of machinery 10 per cent is usually allowed by manufacturers, but it is a question if the steam plant is so short-lived. Twelve years is usually given as the life of an ordinary boiler, yet there are many boilers now in use that have been run for over 20 years. The whole question depends, then, upon conditions of use and care, as much, if not more, than the construction, providing, of course, this is not radically defective.

BLACK JAPAN FOR METALS.—Two ounces of asphaltum and five of umber, mixed with a quart of linseed oil, is said to produce a first-class black japan for metals.

SCIENTIFIC PROGRESS.

SILK DIRECTLY FROM MULBERRY LEAVES.—According to a report recently presented to the Paris Academy of Sciences by Emile Blanchard, a professor of chemistry, there is a hopeful prospect that it will be quite possible, at a not remote epoch, to manufacture silk directly from the leaves of the mulberry tree, without the intervention of the cocoon. Numerous experiments have already been made in this direction, but nothing practical has resulted. M. Blanchard, however, is confident in the experiments made by himself. He is convinced, for instance, that the constituent materials of silk are to be found in the mulberry leaf, upon which the silkworm feeds. By dyeing some of the leaves on which a worm fed and then after awhile opening the body of the chrysalis, he found that nothing had passed through the digestive organs and into the blood except the elements necessary for the production of silk. Other matters had been excluded by certain glands of the worm which had acted as a membrane. M. Blanchard confesses, however, that the silk which he produced by experiments with mulberry leaves was inferior in richness, and particularly in gloss, to that furnished by the cocoons. This resulted from the fact that, as the silk goes through two processes in the glands of the worm, he had only the time and the means to study the first—that in which the silk is evolved in its primary state. He believes, however, that it will he possible eventually to produce, by chemical means, the gloss or varnish which is the result of the second stage through which the silk passes in the body of the insect which produces it.

GOLDEN MAGNESIUM.—M. N. Varren finds that when the metal magnesium is heated in a current of ammonia thoroughly dry, and keeping the temperature below a red heat, it combines with the gas without changing much in appearance, though its chemical properties are much modified; for instance, it will not melt below a bright red heat, and burns, when red hot, with violent decrepitations or small explosions. If the current of ammonia is continued, and the metal in this form heated to bright redness, it is gradually converted into an orange-yellow substance which is permanent. This new product dissolves in acids, and the solution contains ammonia. When fragments of magnesium which have been kept at a dull red heat for some time come in contact with gaseous ammonia, it often happens that their surface becomes dark yellow and shines like gold. The exact nature of this golden magnesium has not yet been made out.

ORIGIN OF FLAVOR IN BUTTER.—Several Danish chemists and analysts have been endeavoring to find out the origin of flavor in butter, which, according to some, is held to be caused by bacteria—whether the flavor be that of turnips, oily, fishy, bitter or tallowy. Prof. Storch has found large numbers of bacteria of a particular variety in oily butters, though he was not able to produce oily butters by the introduction of these bacteria into cream. In other cases he found bacteria which did not differ materially from the normal acid-producing bacteria, which when present in large quantities in cream, produced butter of a tallowy flavor. Similar results were obtained by Prof. Jensen; while Prof. Fjard found that butter from a farm where turnips were not used for the cows had a turnipy flavor, and it is believed by the investigators that this flavor is derived from the presence of a certain kind of bacteria.

IS COLOR BLINDNESS DUE TO A DEFECT OF THE BRAIN?—Prof. Ramsey believes that the particular defect giving rise to color blindness lies not in the eye itself, but in the brain. Certain persons, he points out, are incapable of judging which of two musical tones is the higher, even when they are more than an octave apart. Yet, as such persons hear either tone perfectly, the defect is not one of deafness. He accordingly argues that in such persons the brain is at fault, and thence proceeds to the assumption that it may be equally true that the inability to perceive certain colors is not due to a defect in the instrument of sight, the eye, but to the power of interpreting the impressions conveyed to the brain by the optic nerve. If this is the case, the problem is no longer a physical one. It falls among those with which the mental physiologist has to deal.

MINERAL MATTERS IN COTTON.—Dr. Bowman states that the mineral matters in cotton amount to from 1 to 1.5 per cent of the weight of the fiber. Carbonate of potassium is the chief constituent. There are other salts and phosphates of magnesia and lime, and an amount of peroxide of iron, varying from three to six per cent of the quantity of inorganic matter. The iron is highest in Egyptian cotton. Alumina is also reported as constituting 7.9 per cent in rough Peruvian cotton. This mineral matter is regarded as an integral part of the fiber. If, as Dr. Bowman says, "It is impossible by any means at our command to separate or remove these mineral constituents from the fiber," dyers and printers would be in difficulties; but surely they are nearly all removed in ordinary bleaching operations.—*Textile Recorder, Eng.*

A CURIOUS STONE.—A Finland paper mentions a curious stone in the northern part of that country, which serves the people instead of a barometer. This stone, which they call "Ilmakiur," turns black, or blackish-gray, when foul weather is approaching; fine weather has the effect of turning it almost white.

A SCIENCE OF MYTHOLOGY.—It is believed that the myths and folk-lore of different peoples, when properly studied, will add a valuable chapter to the history of the human mind. "The time is coming," said Jeremiah Curtin, "when mythology may become a science, if scholars will work for that end, but mythology is far from being a science yet. There are many theories and loose statements current about mythology—'disease of language,' 'sun myths,' 'serpent myths,' etc.—but there is no science in all this. It is fancy, guesswork, efforts of men dealing with insufficient and unsatisfactory materials, collected, in many cases, by incompetent hands or by persons who tamper with materials for the purpose of improving them, or fitting them to some theory." The things needed, this author avers, are facts, and facts in mythology are well-preserved myths.

THE CHANGES CAUSED BY DUST CARRIED BY THE WIND.—Water is not the only physical agent concerned in carrying the earth's solid materials from place to place, modern investigations proving that the dust carried by the wind produces astonishing changes in the configuration of the land. The thick deposits covering ancient ruins are now believed to have been largely brought by the air. A French geographer, M. Violet d'Aouest, after referring to Richthofen's description of a vast aerial soil-formation in China, mentions having seen on the flanks of high mountains in Mexico clay strata not deposited by the waters nor by the decomposition of the rocks, but produced by the dust raised from the plains by the winds and left on the hills. These deposits vary from 100 to 300 feet in thickness, growing finer with increase in hight, and ceasing at the limit of vegetation.

IS PURELY SCIENTIFIC TRAINING DESIRABLE? Men of purely scientific training are of less assistance in practical affairs than their education would suggest. The man of science has little faith in new methods or new inventions. He is seldom an originator. His knowledge is that of tradition. He frequently scouts at new ideas as impracticable, because they are not recognized in the books. The inventor seldom travels in the same road with the scientist. The inventor needs to leave the beaten path and press on to the unexplored forest of possibilities. He is often handicapped if he endeavors to conform to rules already laid down by pure science. Few college-bred men have proved inventors. Original thought, bold action, patient persistence, knowledge of nature's laws, are prime factors in the successful career of the inventor.

A CURIOUS PHENOMENON.—When the sun sets in the sea, a curious appearance, as of a bluish-green flame, is sometimes observed. This has been thought to be due to the light passing through the crests of waves. But Prof. Schncke considers this view disproved by such an observation as that recently made by Prof. Lange, at a watering-place on the Baltic. Shortly before sunset the disk was divided in two by a thin strip of cloud, and just as the upper part disappeared under the cloud, the blue flame was observed. Thus the cause appears to be in the air, not in the sea. It is a case of atmospheric refraction, and as a planet, seen near the horizon with a good telescope, appears drawn out into a spectrum, with the more refracted blue-violet end higher than the red, so the last visible part of the sun furnishes the blue-violet end of a spectrum.

HOW TO FORETELL A STORM.—When a storm is advancing, the wind blows to meet it. Thus a wind blowing from the east or southeast indicates the approach of a storm from the west. When the storm center has passed, however, the wind changes and follows the storm. If a person has a good barometer and a wind gauge, he can tell pretty correctly when a storm is coming. Without the instruments the clouds may he watched, and when seen to he moving rapidly from the southeast, and there are indications of the presence of moisture in the air, a storm is not far away.

ELECTRIC RAILWAYS.—As illustrating the progress of electric railways, it may be stated that there are about 130 towns in the United States with one or more electric railways in operation, construction, or under contract, and that these roads comprise about 1500 miles of track, equipped with about 1700 motor cars, requiring 3000 motors of an aggregate capacity of 45,000-horse power, and steam and electrical generators of 25,000 horse power. The roads in operation are making about 100,000 miles per day, and within three months the mileage will be doubled.

A NEW ZINC FOR ELECTRICAL BATTERIES.—The Electrical Improvement Syndicate of Boston control the output of a new zinc, the important feature of which is its amalgamation, the mercury being incorporated into one homogeneous mass, making its life three times as long as ordinary amalgamated zinc. The internal resistance is very much less, while the electro-motive force is increased. The zinc will be made in all sizes and forms, and can be applied to any battery.

GOOD HEALTH.

The Liver.

The liver is the largest gland of the body. It carries on several separate and distinct lines of work. We are best acquainted with its work of making bile, which is largely, if not entirely, made up of waste elements taken from the blood. Bile is a golden-yellowish fluid, but when vomited from the stomach it is green, and many people suppose that this is its natural color. The change is due to the action of the gastric juice.

It is an excretory and digestive fluid, converting fats which are not acted upon in the stomach, but in the small intestine, into an emulsion. Bile also acts upon the mucous surfaces, stimulating the absorption of food after it is digested.

The digestive fluid of the stomach is acid, the bile is alkaline, and the two being poured into the small intestine simultaneously with the food, prevent an irritating action of the gastric juice. Pure gastric juice is so strong an acid that it will irritate the hand if it is placed upon it. Were not the stomach protected in a peculiar manner, it would itself be digested with the food, as often happens in cases of sudden death after a person has just eaten a hearty meal.

Bile stimulates peristaltic action, by which means the food is moved along through the entire length of the intestines. It is an antiseptic, and preserves the food from fermentation and decay in its slow progress through the 25 feet of alimentary canal. This is one of its most important uses. With the food is always taken a quantity of germs, and they would surely induce fermentation but for this preventive agent. About 14 hours are required for the complete process of digestion from the time food enters the stomach until it is entirely absorbed. If a single one of these several offices be absent or interfered with, it seriously affects the health of the individual.

The liver itself is a digestive agent. All the digested food, with the exception of a small portion of the fat, is absorbed and carried by the portal vein to the liver. The heart pumps blood direct into the general circulation, but all of it which goes to the stomach, spleen and other abdominal viscera is carried to the liver before it is allowed to go into the general circulation. Thus the liver acts as a filter for the blood received through the portal circulation and completes the work of digestion. The stomach is only the ante-chamber where the process of digestion is commenced.

There are 25 feet of intestines, and the work of these upon the food is vastly more important than that of the stomach. When the stomach and intestines have done all that they can do to the food, its nourishment is expended and it is carried off as waste matter by the kidneys. The liver acts upon all its elements, which no other organ does. Starch constitutes one-half to two-thirds of all our food. When we take it into the month, the saliva begins to change it into sugar. It furnishes heat for the body and muscular and brain force, hence we need a large amount of it.

In the process of digestion, a large amount of sugar is manufactured. If all this were poured at once into the circulation, it would thicken the blood and render it so sluggish that the blood corpuscles would all be destroyed, and it would have to be hurried out of the system to save the person's life; so the liver goes immediately to work to change the sugar back into liver starch, and stores it up in its tissues. Then it begins slowly to change the starch back into sugar again, and doles it out for use as needed for force, heat, etc.

The liver is also a sort of rendering establishment. It takes what would otherwise be offensive and dangerous elements and utilizes them, just as the rendering establishments of large cities take the dead animals and offensive garbage and make them of value. The liver takes all the broken down tissues, the millions of dead blood corpuscles, works them over and changes them into material of which corpuscles can be made. The coloring matter found in these corpuscles is worked over into material which furnishes coloring matter for the eyes and hair, as well as furnishing color to the bile. Nature shows wonderful economy in thus taking old, worn-out material and converting it into such a variety of new uses.

The bile containing waste alkaline substances, also makes a little soap out of the fat that aids in preparing the rest of the fatty material for absorption.—*Hall's Journal of Health.*

THEISM, THE NEW NERVOUS DISEASE.—Attention has recently been drawn to a new nervous disorder said to be especially prevalent in England and America. It is called "theism," or tea-drinker's disease, and is said to exist in three stages—the acute, subacute and chronic. At first the symptoms are congestion of the cephalic vessels, cerebral excitement, and animation of the face. These physiological effects being constantly provoked, give rise, after awhile, to reaction marked by mental and bodily depression. The tea-drinker becomes impressionable and nervous, pale, subject to cardiac troubles, and seeks relief from these symptoms in a further indulgence in the favorite beverage, which for a time restores to a sense of well-being. These symptoms characterize the first two stages. In chronic cases, theism is characterized by a grave alteration of the functions of the heart, and of the vaso-motors, and by a disturbance of nutrition. The patient becomes subject to hallucinations, "nightmares" and nervous trembling. With those who take plenty of exercise, and habitual consumption often may be indulged in with impunity, but with women and young people who follow sedentary occupations this is not the case. The best treatment for theism is said to be indulgence in free exercise, such as walking and open-air life.—*Journal of the American Medical Association.*

USEFUL INFORMATION.

TO OBTAIN A LIGHT INSTANTLY WITHOUT THE USE OF MATCHES, and without the danger of setting things on fire, is an easy matter. Take an oblong vial of the clearest of glass, put into it a piece of phosphorus about the size of a pea, upon this pour some pure olive oil heated to the boiling-point, the bottle to be filled about one-third full; then cork tightly. To use the light, remove the cork, allow the air to enter, and then recork. The whole empty space in the bottle will then become luminous, and the light obtained will be a good one. As soon as the light becomes dim, its power can be increased by opening the bottle and allowing a fresh supply of air to enter. In very cold weather it is sometimes necessary to heat the vial between the hands to increase the fluidity of the oil, and one bottle will last all winter. This ingenious contrivance may be carried in the pocket, and is used by the watchmen of Paris in all magazines where explosive or inflammable materials are stored.

ECONOMY IN THE USE OF COAL.—In burning coal in a grate it is very important, in the matter of economy, to place carefully the half-burnt lumps to the front of the grate, and then putting the fresh coal at the back, whenever the fire is "made up," taking care not (as most servants do) to put any coal on any flame there may happen to be, but at the back of it, as by that means you maintain a cheerful fire, benefit by the rays of the heat given off from the flame and live coals while the fresh is lighting, prevent in some cases your chimney smoking, and make some of the smoke from the fresh coal burn (a considerable saving), and which would otherwise cause your chimney to require sweeping oftener.

TO DETECT ADULTERATION IN WHITE LEAD.—If any one has a suspicion that white lead is adulterated, buy a pound or two of the substance, place it in a ladle and set it on fire. After it is completely burned there will be a quantity of metallic lead in the bottom of the ladle. After the ladle is washed and dried, it may be weighed; should it weigh exactly as much as the white lead before being burned, then the white lead is pure. Should a less weight of lead be found, there is an adulteration, the per cent of which may be obtained by dividing the loss of weight by the weight of the white lead before being burned.

STEAM VS. COMPRESSED AIR IN GUNNERY.—The substitution of steam for compressed air in a gun intended to throw shells containing dynamite or other high explosives is proposed in France, the advantages claimed being the furnishing of power direct from the boiler, without the use of air-compressing machinery. The pressures usually carried in steam boilers would not be sufficient for this purpose, but boilers are promised of a special type, which will supply steam at a pressure of from 600 to 800 pounds, and which will, at the same time, be safe and easily handled.

AN INVENTION, in the sense of the patent law, means the finding out, the contriving, the creating of something which did not exist and was not known before, and which can be made useful and advantageous in the pursuits of life, or which can add to the enjoyment of mankind. In other words, the thing patented must be new and be useful to an appreciable extent, though the measure of that usefulness is not material. Any degree of utility appreciable by a jury is sufficient, upon the question of utility, to sustain a patent.

THE RELATIVE VALUE OF GOLD AND SILVER is now a matter of growing interest to the commercial world. With silver worth 103⅛ per ounce, gold is worth 20 times as much as silver. The point where the free coinage of silver is to be compulsory by the proposed bill is when its value reaches one-sixteenth of the value of gold. This will require a further advance of only .25⅞, which will bring the price of silver up to 1.29⅜, or one-sixteenth of the value of gold.

COLOR AND NUMBER IN HAIR.—A scientific German has taken four heads of hair of equal weight and then proceeded to count the individual hairs. One was of the red variety, and was found to contain 90,000 hairs. Next comes the black with 103,000 hairs to its credit. The brown had 109,000, and the blonde 140,000.

CAMPHOR, which lately doubled in price, owing to the demand for it to make smokeless powder, has now receded to near its normal value in consequence of the fact that the European governments have abandoned its use in that manufacture.

ELECTRICITY.

Electric Heating.

The enormous heating-power of the electric current, which the introduction of the dynamo demonstrated, led to the early suggestion that the current, besides its utilization for light and power, might be employed as a heating agent. Without entering into the possible economy of such an employment of the electric current as compared with the other methods now in use, it is beyond question that, as a heating agent pure and simple, there is none which is more perfectly adapted to the purpose than the electric current, supplied, we will say, from a central station. It furnishes heat without any of the accompaniments which are invariably the adjuncts of other heating methods.

An ingenious apparatus for this purpose, adapted especially for employment in connection with the alternating current, has been devised in which the secondary of an induction coil is made in such a form as to generate a maximum of current to produce the desired heating. As the inventor naively suggests, the heating of the iron core, so objectionable a feature in the usual alternating current apparatus, presents no obstacle to the successful operation of the electric heater, and might indeed be classed as one of its advantages.

The promises of the use of electricity in this direction are excellent, and many ingenious electricians are working at the problem. Already a system has been devised for heating railroad trains, and while the principle involved is not altogether a newly discovered one, the present application is far more practicable than when it was first employed. And why should we not obtain heat as well as power and light from the current, since that, quite as well as the two last mentioned, is one of its properties?

At the forthcoming electrical exhibition in St. Louis it is intended to illustrate very fully the remarkable progress which has been made in the application of electricity for heating purposes. Among other devices, there will be ordinary looking flat-irons to which flexible cord is attached, and to which the heat can be instantly transmitted by a slight pressure. Soldering irons with similar connections can be heated without any waste of time, and the usual fire-pot can be dispensed with. Tea-kettles, cooking dishes, tin pans and every description of culinary articles can in the same way be placed anywhere, and their contents boiled or baked in the time ordinarily taken in lighting a fire. Portable radiators will also be on exhibition, which can be carried with the greatest ease from one room to another, and which, when connected, will warm the apartment. Supplementing this exhibit will be a number of improved thermostats or temperature controllers, by which the temperature of a room can be absolutely regulated.

Electricity Versus Steam.

The *American Machinist*, in a recent article, thus discusses the probability of electricity ever superseding steam upon railroads:

By the use of an electric motor the reciprocating parts of the present locomotive can be avoided, and none but rotating parts employed; this will make practically perfect balancing possible, and together with the fact that an electric motor for a given train and speed can be lighter than the present locomotive, would seem to give considerable advantage to electricity, while the difference in economy between the best locomotives and the best stationary engines of the compound condensing type gives a margin of about 50 per cent for loss of energy by conversion into electricity, and back again into motive-power.

Whenever it is shown that the loss by this conversion and reconversion is less than 50 per cent, under ordinary every-day working conditions, the question of economy will be in a fair way of settlement, though there will still be the question of the comparative cost of repairs and interest on money invested in motive-power machinery, and this is a point about which there is little absolute knowledge as yet.

But there is some doubt as to whether the system of having power installations along a line at intervals, generating electricity to be taken by the motors from a conductor placed along the track, would prove practically applicable to railroads, especially on very busy and crowded sections; but it is safe to say that the science of electricity is not yet sufficiently developed to enable any one to foretell in what way it will supersede present arrangements, and it is well for those who attack the problem to remember the maxim, "Never despise your enemy," for the locomotive is quite an efficient machine, all things considered, and we are by no means sure that it has reached the limit of its development in regard to either speed or economy.

ELECTRIC MOTORS ON GATLING GUNS.—Should there ever be another war between two of the foremost nations, electricity would certainly perform a very important part in the operations. The latest conception in this line is the firing of Gatling guns by electric-motor power. The Crocker-Wheeler Motor Co. now have in their new shop a Colt Gatling gun, to which they propose to attach one of their motors, by the operation of which it will be possible to fire 1000 shots per minute. The heating of the barrels will be the only limitation to rapidity of firing. By the hand method it is possible to discharge 500 shots per minute. One thousand shots a minute would soon annihilate an army.

ENGINEERING NOTES.

A FIRST PRINCIPLE OF BRIDGE-BUILDING.—If one plank would hold up 100 pounds on the center, then two planks placed side by side would hold up 200 pounds; while, placing the planks one on top of the other, and nailing them firmly together, they would hold up 400 pounds. In this way we see that, in order to increase the strength of the bridge or beam faster than we increase the amount of the material, the increased amount of material should go into the depth of a beam and not into the width of it. This is one of the first principles in the resistance of material, that the strength of a beam varies directly as the width—that is, if we make it twice as wide, it will hold twice as much; and that the strength varies as the square of the depth—that is, if we make it twice as deep, it will hold up four times as much. If we make it three times as deep, it will hold up nine times as much of a load. So that it can be readily understood that, in order to increase the strength of the bridge or beam without increasing the material in the same proportion, the increased amount of material should be put into the depth and not into the width.

TREE-FELLING BY DYNAMITE.—Some interesting experiments were made the other day in the vicinity of Copenhagen, with tree-felling for military purposes, by dynamite. The object was to ascertain the saving in time and labor effected by this method and the results were exceedingly satisfactory, far more so than is understood to have been the case elsewhere. Trees of as much as three feet in diameter were brought down in some 20 to 25 minutes, whereas the time occupied by ordinary felling would have been 10 times as much.—*Engineering, London.*

UTILIZING RUNNING STREAMS.—The utilization of running streams is the object of many recent devices, among which may be mentioned that of M. Tayn, a Russian engineer. His apparatus consists of an endless cable, carrying a series of canvas cones, which open and shut like an umbrella. The cable passes over a double drum on board a pontoon, and at the other end over a pulley suspended from a buoy. On the lower part of the rope the cones are opened and forced forward by the current of water, thus setting in motion a shaft or drum.

ENGINEERING DANGERS.—The great monsters of engineering skill and genius call for the sacrifice of a great deal of life and limb in their construction. The greater the engineering feat the more extensive is the loss of life. In the construction of the Eiffel tower, for instance, 26 lives were lost according to the official returns of the French Government, while on the great Forth bridge of Scotland a list of 40 lives lost has been published.

A CANADIAN RAILWAY TO ALASKA.—The project for a Canadian railway to Alaska is about taking definite shape. Application will be made to Parliament at the next session for the passage of an Act incorporating a company to build such a road. If the Government at Washington is not more careful of our national interests, the Canadians will get away with the bulk of our northern carrying trade.

ELEVATED RAILROADS IN BOSTON.—The Street Railway Committee of the Massachusetts Legislature has reported to the Senate a bill granting a charter to the West End Street Railway Co. to construct, equip, maintain and operate a system of elevated railways in Boston. The document provides security and restrictions for all the interests of private parties which may be affected.

DR. PIERCE is doing nothing with the immense water-power he controls at the outlet of the Big Bend mining tunnel. The English syndicate that lately bought the Cape claim intends to make good use of its water. Operations at the Golden Gate mine are being pushed, and it is hoped to have the river current diverted before many weeks, when mining will begin.

AN IMMENSE BRIDGE SPAN.—One of the greatest as well as most interesting triumphs of modern engineering is the cantilever bridge across the Firth of Forth. One of the cantilevers of this structure, set up on end, would be nearly as tall as the famous Eiffel tower, and whereas the latter weighs 7500 tons, the Forth bridge has required over 50,000 tons of steel.

THE Oakland & Berkeley Rapid Transit Company has decided to propel its cars by the Sprague system. It is expected to have the road in operation by November 1st. Cars will start to ply between Oakland and Berkeley every ten minutes.

COMPOUND LOCOMOTIVES, burning petroleum, are now being introduced upon Russian railroads.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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W. B. EWER.....SENIOR EDITOR

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Our latest forms go to press on Thursday evening.

Entered at S. F. Post Office as second-class mail matter

SAN FRANCISCO:
Saturday, July 5, 1890.

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☞ *See Advertising Columns.*

Passing Events.

There is little or no change in the situation as regards the molder's strike. Some few more men have left the shops, but others are on the way to take their places.

Elsewhere in the PRESS will be found a brief description of the first electrical plant to work a quartz mill in California. More attention is being turned to the application of electrical power to mining, and a few practical examples of this kind will do much toward its more general use.

The annual public demonstration of patriotism occurs this week on the Fourth of July holiday. Another patriotic theme is the birth of more States into the national family. Idaho and Wyoming are the latest arrivals—twins of 1890 following the quartet of 1889. It is expected that President Harrison will sign the bills for the admission of these two States on the National holiday.

On Wednesday the silver conferrence met and discussed the difference between the Senate and House on the silver question. At this writing it is difficult to form a correct opinion regarding what the outcome of the conferrence will be, but the prevailing opinion is that an agreement will be arrived at, and the bill as agreed upon be reported back to the two branches of Congress, which will lose very little time in passing it.

Deep Prospecting for Gold.

As stated elsewhere in the PRESS, there are some very deep gold mines in the Colony of Victoria, the deepest of which is 2640 feet. This is the Lansell 180 mine, Sandhurst, and rather a curious experiment is being tried there. The owner offered to place this deep shaft at the disposal of the Government Mine Department, for the purpose of having the ground tested by diamond drill beyond 2640 feet depth, he furnishing the power—compressed air—for the drill. The Department of Mines runs a number of drills for just such purposes. They have 14 diamond drills prospecting for gold and coal in different parts of the colony.

The Mines Department accepted the offer, and at the suggestion of the underground manager at Sandhurst, who has a thorough knowledge of the country, and was instructed to report on the best portion for boring, they began a *horizontal* bore at the 1300-foot level. It is thought that some one of the well known ledges would probably be cut by this horizontal bore. When this is completed it is the intention of the Department to commence boring vertically at the bottom of the shaft, 2600 feet, for a further distance of 1000 feet.

These operations will not only be of great scientific interest, but will also afford information as to the character of the country penetrated, which must be of great value to the mining community in general, and more especially so in Sandhurst district, where deep mining is carried on to a greater extent than elsewhere. The mine is well situated for such a trial, so far as depth and nature of workings is concerned.

It is to be remembered that this undertaking is by the Government, not private individuals, and is to obtain knowledge which is useful for the mining community. It is a practical step, however, which will surprise many in this country, where the mines do everything for the Government and the Government nothing for the mines. The idea of anything of the sort being done here to encourage the miners has never been entertained. But over there in the Australian colonies they encourage the miners in every way. They give rewards for the discovery of new fields, build roads to new camps, test peculiar ores, establish mining schools, publish practical information, and even assist in prospecting a field for the benefit of all. The miners there do not have to fight for fair play as do our silver and lead miners here. We could in this country take several leaves out of the mining books of the Australian colonies greatly to our own benefit.

Underground Temperature.

It is a well-known fact that there is a certain distance below the surface of the earth where the temperature is invariable throughout the year, and this invariable temperature is the mean temperature of the year on the surface at the place of observation; but on going down below this point the temperature increases in accordance with the peculiar conductivity of the rock, but in such a manner that the principle is imperfectly understood. Still it is known that some rocks are better conductors of heat than others; hence it is inferred that the class of rock in a certain locality will produce a higher temperature than other rocks of a different description.

In the coal mines of England the general increase of temperature has been found to average for the first 100 feet one degree for every 50 feet below the surface, for the second one degree for every 70 feet, and for the third 600 feet one degree for every 85 feet; but this is taken as the average and not as being uniform throughout. For instance, if the Rosebridge colliery be taken, Prof. Everett points out that for the first 1674 feet the temperature increased at the rate of one degree for every 57.7 feet, for the next 771 feet the increase was one degree for every 48.2 feet, and for the portion between 1815 feet and 2013 feet, a distance of only 198 feet, the temperature increased at the rate of one degree every 33 feet, while for the lower 1296 feet the temperature increased at the rate of one degree in every 54 feet.

Gold Mining in Victoria.

The gold-mining industry in the Colony of Victoria is in quite a flourishing condition, and an increased output is expected this year. The results of work in the last quarter of 1889 showed a product of 162,902 ounces of gold, being the highest yield for any individual quarter since 1887. Ballarat district has the largest yield and Ararat the smallest. Information was received by the mining registrars during the quarter showing the quantity of quartz crushed to be 193,053 tons, from which 97,726 ounces of gold were obtained, being an average of 10 dwt. 2 98 gr. per ton. The Gippsland district had the highest average, namely, 16 dwt. 7.06 gr., while that of Ballarat district (9 dwt. 0 33 gr.) was the smallest. It is noteworthy that the district Ballarat, having the lowest grade ore, produced the most gold and paid nearly double the dividends paid by any other district.

The area of auriferous ground worked upon during the quarter is estimated at 326 square miles (519 acres), which is about 2⅓ square miles less than that for the previous quarter.

During the quarter there were 24,047 miners engaged in gold mining throughout the colony, which was a decrease of 440 compared with the number at work the preceding quarter. In quartz mining 12 361 were employed and 11,686 in alluvial. The number of Europeans at work in both classes was 20,668, and of Chinese 3379, which, when compared with the previous quarter, shows a decrease of 271 and 169 respectively.

The ten deepest shafts in Victoria on the 31st December last were as follows: Lansell's 180 mine, Sandhurst, 2640 feet. Moonlight Company, Pleasant Creek, 2409 feet. Victoria Reef Quartz Company, Sandhurst, 2302 feet. Victory and Pandora Company, Sandhurst, 2300 feet. New Chum and Victoria Company, Sandhurst, 2228 feet. North Old Chum Company, Sandhurst, 2210 feet. Old Chum Company, Sandhurst, 2128 feet. Great Extended Hustler's Company, Sandhurst, 2040 feet. Garden Gully United Company, Sandhurst, 2040 feet. New Chum Railway Company, Sandhurst, 2040 feet.

The Mechanics' Fair.

The next industrial exhibition under the auspices of the Mechanic's Institute of this city, will open on September 18th and continue until October 25th. Mr. E. S. Culver, the secretary of the Institute, has been appointed superintendent of the fair. This gentleman has been connected in an official capacity with these annual fairs for a number of years past, and has the experience and energy to make him an excellent superintendent.

It is greatly to hoped that the industrial classes and manufacturers in California will come to the front on this occasion with their products. This is by no means a local, San Francisco fair, but intended to represent the industries of the whole State. This being the metropolis of California, is the proper place to hold such an exhibition, seeing as it does so large and constant an attendance. There is no other opportunity at all equaling it, for manufacturers and dealers to exhibit their wares to those to whom they must look as purchasers.

Space, power, light and visitors the exhibitor has without cost. All that is required of him is to place his goods in some sort of proper order, and the arrangement is left to himself. As an advertisement nothing could be cheaper or better. The big building is filled with a sight-seeing crowd night and day. All sorts and conditions of people go there—the rich, the poor and the intermediate class.

It is desirable that more of the manufacturing industries be represented than has been the case of late years. To this end, those persons interested in them should at once bestir themselves to prepare for an exhibit. There is plenty of time for this, but it will not do to put off preparations too long. To make a creditable exhibit each one should make arrangements some time in advance so that he will be ready on the opening day.

CALIFORNIA ELECTRICAL SOCIETY.—At the last meeting of the California Electrical Society the Committee on Location reported that they had leased two rooms on the second floor of the Murphy building, on the corner of Jones and Market streets. The committee's action was indorsed, and the society decided to make an appropriation out of its treasury toward furnishing the rooms with a laboratory and other useful things. M. Davis, L. L. Baker, and P. B. Cornwall, who were elected honorary members at a previous meeting of the society, sent letters, thanking the organization for the honor conferred upon them.

California Asbestos.

Asbestos is found usually in small quantities in very many localities in this country. The great difficulty connected with the economical mining of this substance, has been that the deposits are generally found in small pockets. Both hornblende and pyroxene asbestos occur, the former being the more common, though it is often difficult to distinguish between these varieties. Most of the bisilicates, excepting those containing much alumina, pass into the fibrous varieties, all of which are known as asbestos, though the term "amianthus" is sometimes applied to the finer and more silky kinds. The leading localities in which asbestos is found are in Georgia, New York, Maryland, New Jersey, Pennsylvania and Virginia.

There are many places in California and Nevada, where asbestine deposits are found. While the mineral in some of these localities occurs in great masses and is remarkable for its length of fiber, it has generally been lacking in fineness, flexibility, or other desirable qualities.

For these and other reasons, such as the cost of mining and transportation and the limited local demand, the home product has not been able to compete with imported or Eastern asbestos in the California market. Deposits of the different varieties of the mineral have been found at a number of other places in the Pacific States and Territories, but so few of these have ever been developed in regard to their value or character little is known. Asbestos seems to be abundant enough in this region, but it is difficult to find it in such a form as to be acceptable to the purchasers. A gentleman informed us last week that he had been for two months trying to find a good deposit of this mineral in California, so that he could either purchase the product or the claim. He had found nothing satisfactory. If any of our subscribers have a deposit of the fibrous variety, and will write to the PRESS, we will send the name and address of the parties desirous of purchasing.

As a rule, it may be stated that the American asbestos is inferior in textile qualities to that which comes from the province of Quebec, Canada, being more brittle and harsh in fiber as well as shorter, and is therefore not so well adapted to the manufacturing of spun and woven goods. There appears to be little difference between the domestic and foreign in point of fireproof qualities, though some manufacturers claim that the domestic asbestos will stand a higher degree of heat. The American is better adapted for making fireproof cements and paints for which purposes it is generally used, length of fiber being unessential. The Canadian is said to be the best for general use and the Italian best for textile purposes.

Asbestos is used in making liquid and fireproof paints, roofing, piston-packing, valve-packing, covering steam pipes and boilers, fireproof cements, sheet and roll mill-board flooring, felt, etc. It is often used in combination with hair felts and other substances.

Engineering Work on Mount Conness.

Prof. George Davidson of the U. S. Coast and Geodetic Survey has his telescope and camping outfit ready packed to start for Mount Conness the moment he learns that the advance party has reached the summit. The mountain is covered with snow, and the outfit for the trip has to be conveyed first in wagons, then on sleds, next on the backs of mules, and then to the summit on the backs of men.

Prof. Davidson will make the ascent for the purpose of taking observations for the great trianguiation survey of the United States that is being made every summer. The triangulation of the Atlantic and Gulf Coast is nearly completed, but the Pacific Coast will still take several years. The observations are taken only from the tops of high peaks and when finished will furnish an absolutely accurate survey of the coast countries.

Prof. Davidson will remain on Mt. Conness until the latter part of August.

Bowers' Roller Quartz Mill.

The distinguishing feature of the superiority of these rolls for crushing quartz and other hard substances, consists in the shape of the rolls, as shown in the engravings on page 1. They are highly recommended for either wet or dry crushing, and for silver, gold, cement, phosphate, or concentreting mills. The old Cornish rolls were in use for crushing ores long before the introdnotion of stamps; hut, owing to the fact, the faces of both the rolls soon wore concave, thus preventing them from crushing fine enough for metallurgical purposes, the introduction of stamps hecame necessary. In the Bowers' Roller mill one roll is made concave on its face, and the other is made convex on its face, which improvement, together with other details in construction, remove the objections to the Cornish rolls. The rolls in the Bower's Roller mill wear perfectly even and true on their faces, and will continue to do perfect work until the steel shells are worn so thin as to require removal. When the roll shells are worn out they can be removed and new shells substituted in a few minutes, making the machine as good as new.

This roller mill was invented and patented by a practical stamp-mill builder of thirteen years practical experience in designing and hoilding all kinds of dry and wet silver mills on the Pacific coast. He full well understands the constant attention required to keep tappets, cams, shoes and dies in order in a stamp mill; the small amount of ore that can be crushed per stamp in dry mills, and the great cost of stamps set up ready to run, and his efforts to meet and overcome these objections, as well as the faults of all roller mills hitherto used for this purpose, resulted in the invention named.

Mr. Bowers' Roller quartz mill is a good substantial machine, capable of reducing the hardest quartz with great rapidity, and affords great saving in space, power, labor, size of buildings, excavations, etc., as compared with stamps. These roller mills occupy only about one-sixteenth the space required for stamps to do the same work. The claim has been made by some that no crushing device could he made that would crush as fine as stamps, but the manufacturers claim that the tests thus far made show that Bowers' Roller quartz mill can crush fine enough to pass through a 100-mesh screen, while in practical stamp mill work 40 to 60-mesh is as fine as is ever used.

The claims of superiority made by its manufacturers for this machine may be summarized as follows:

It is considered a better mill than Stamps; their use reduces the entire cost of mill to about one-half the cost of a complete stamp mill; great saving in labor; great saving in power; reduces the entire cost of treating each ton of ore to a minimum, without in any way reducing the percentage of saving of the precious metals; it enables companies or private owners of mines to put in a mill, under circumstances which would not warrant the greatly increased cost of a stamp mill.

Stillwell & Bierce M'f'g Co. of Dayton, Ohio, are sole manufacturers of the Bowers' Quartz Roller mill, and will furnish additional information on application.

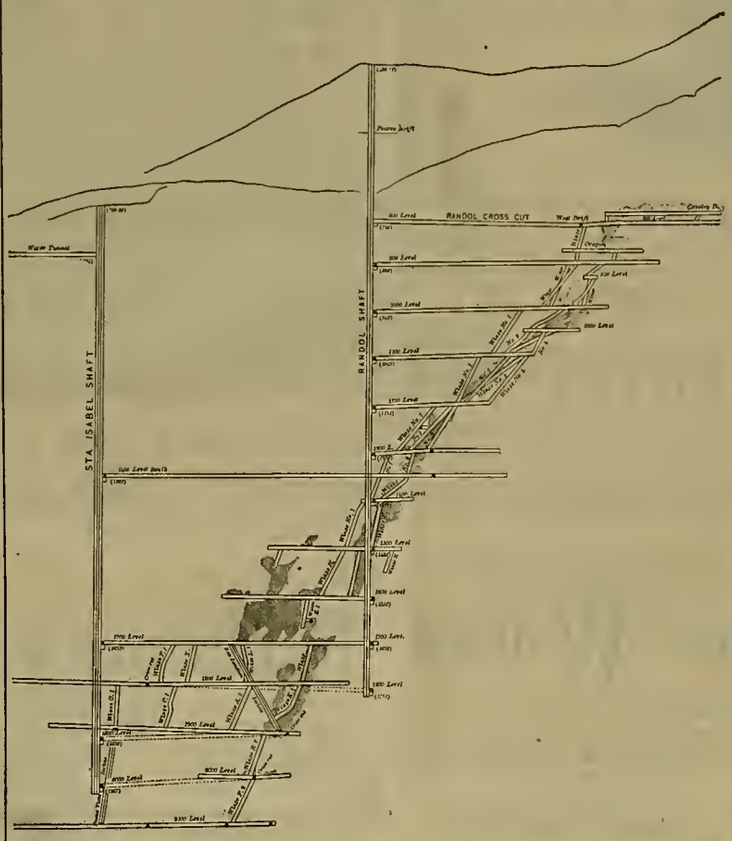
The New Almaden Quicksilver Mine

The surface and workings of the New Almaden quicksilver mine have been surveyed with the utmost care by the officers of the Quicksilver Mining Co., and data exist for the construction of any desired sections. A fine opportunity is thus afforded for a study of the structure of this most important deposit. In the MINING AND SCIENTIFIC PRESS of May 31 last were some sectional reviews of this famous mine taken from Dr. Becker's U. S. Geological Survey monograph on the Quicksilver Deposits of the Pacific Slope. On this page are two more sections cutting the northern portion of the mine or parallel north and south planes. One of them is taken through the Randol shaft and the other 350 feet west of it. The two are to be considered together. The eastern section through the shaft shows only the edge of the ore channel or that series of deposits which crops out on Mine Hill.

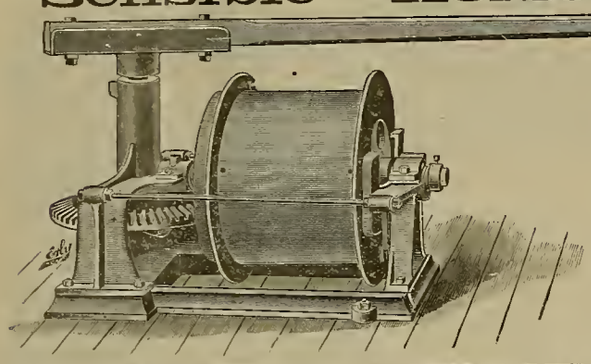
To this series belong the various Santa Rita "laborer" exhibited on the southern part of the section and the series of winzes extending from the Santa Rita to the 1400-foot level of the Randol shaft, showing here and there a small stope, sunk along the course of the same fissure. The main stopes on this section are on the north fissure, which divides the great body of rock forming the hanging country of the south fissure from the region north of the mine.

The quicksilver mines and reduction works of New Almaden are fifteen miles south of the city of San Jose, Santa Clara county, in the Santa Cruz mountains, at an elevation of 1700 feet above the sea. These mines were first worked for quicksilver in 1845, but the operations were on a small scale, and no record exists earlier than 1850. They have been the most productive quicksilver mines in the world, excepting only the mine of Almaden in Spain. They are developed to a depth of 2300 feet, and the workings extend horizontally over an area one mile square.

About 500 men find steady employment—the work being actively prosecuted throughout the year. From the 1st of January, 1864, to the 31st of December, 1889, the number of feet of drifting and sinking in the mines of the company, as shown by the records, amounted to 46.34 miles, at a cost of $2,067,862.63; this does not include the excavation made in extracting ore during the period named, nor any expenses for the same, while for the ground opened up during the previous period (from 1850 to 1864) 15 more miles of drifting and sinking can be added. The reduction works consist of eight furnaces, include the most improved methods for working quicksilver ores, and may be considered as the most complete and perfect in every respect in the world.



"Sensible" Horse Power Hoisting Whims.



These Hoisting Whims are built entirely of Iron and Steel, mounted on a heavy base plate, and, consequently, are very durable and cannot be affected by extremes of either cold or heat or climatic influences.

The hoisting drum is completely under the control of the person in charge of the hoisting or lowering through the shaft of the mine.

As the drum is entirely independent from the driving gears, the operations of hoisting, dumping bucket and lowering can be performed with the horse in constant motion, a feature not possessed by any other horse hoist in the market and one that greatly increases their capacity by avoiding the loss of time due to stopping and starting the horse.

They are very light and compact, and can be packed for transportation by mules. Their cost of erection is very slight; two men, in half a day, being able to put one in place, ready for work.

With each Whim, working drawings are furnished, showing in detail the proper construction of Gallows Frame and foundation for Hoisting Whim.

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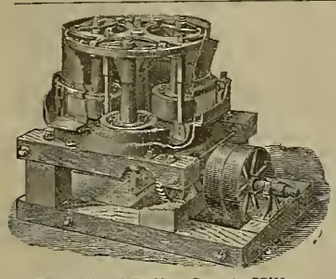

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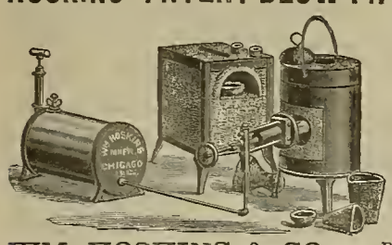

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Our water is of the worst character, containing such bad impurities as **sulphate of lime, carbonate of lime, mud, and everything that is bad.** Very truly yours, WM. R. JONES, Gen. Supt.

No water in the United States produces scale in greater quantity or of a harder nature than the Monongahela River, containing SULPHATE and CARBONATE of lime, iron, MAGNESIA, SILICATE, SULPHUR, ALUMINUM, etc. The following well-known manufacturers, who are large steam users IN PITTSBURGH, and using the water from said river as boiler-feed for all their boilers, USE THIS RESOLVENT in their steam plant, and to whom reference is hereby made: Carnegie Brothers & Co., Proprietors of the Edgar Thomson Steel Works; Dilworth, Porter & Co.'s Spike Works; and Oliver and Robert's Wire Co.; and many other firms in the great manufacturing center WHERE THE RESOLVENT IS MADE. Reference is also given to Robert McMahon, Boiler Inspector for Alleghany Co., Penn., and to the following Railway Companies who use it on their locomotives: Kansas City, Fort Scott & Gulf Railroad; Central Iowa; Mexican Central; Delaware, Lackawanna & Western; Burlington, Cedar Rapids & Northern, Terre Haute & Indianapolis; Mexican National; and Denver & Rio Grande Western.

Upon receipt of order, WITH THE PROMISE OF FAITHFULLY CARRYING OUT THE PRINTED DIRECTIONS, we will furnish, FOR FIRST INTRODUCTION, a Barrel, or Half Barrel, of the Resolvent, and the invoice will bear the following stamp:

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☞If in want of Machinery of any description, write us for Descriptive Circulars and Prices.

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These SHOES and DIES are in extensive use in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited, subject to above conditions.

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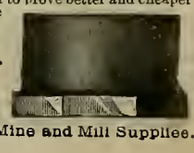

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Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

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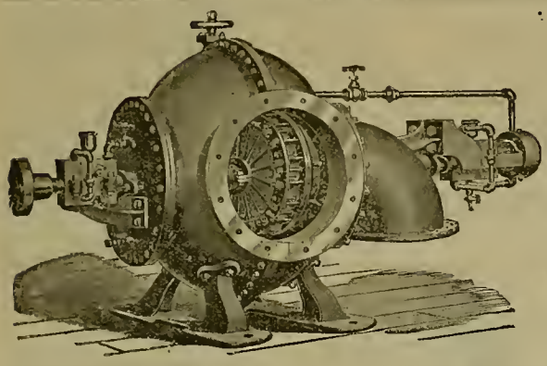

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These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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FRASER & CHALMERS, General Agents, Chicago, Ill., and Denver, Col.

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Idaho's rapid increase in late years in mineral production is due to the scientific methods formed by capital and long experience. There is large opportunity throughout the mining districts of Idaho to develop mines with almost the certainty of large profits. Gold bullion is cashed at the Government assay office in Boise City. At the same time no mining field offers more attractive inducements to the hardy miner whose capital lies chiefly in his experience and in his pick. Full and complete information concerning Idaho mines will be mailed on application.

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Another great opportunity for capital in Idaho is in large irrigation enterprises. Projects are on foot to reclaim several hundred thousand acres, but there is room for many other such projects. Idaho has abundance of water, and the profits of irrigation are large and sure.

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10 SIZES FROM $7 TO $75
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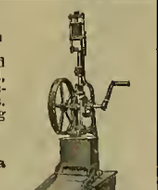
Day's Improved Quartz Stamp Mill.



This Mill is designed for the Prospector, the Assayer and Sampler of Gold and Silver-bearing rock. It is a perfect mill, built entirely of metals, and of the best mechanical construction; will amalgamate perfectly in the battery or on plates. It strikes a sharp, heavy blow with a light stamp. Shipping weight, 225 lbs. Price $75. Address

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N. B.—CHAPPARELL, Butte Co., Cal., Nov. 10, 1889.—Mr. Jas. Day, Chico: The little mill is a daisy; it comes up to all expectations; it works perfect in all respects. Yours truly,
WALKER, REESE & CO.

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Practical and Industrial Chemist, Assayer and Geologist,

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☞ Will report on the condition and value of any mining property on the Pacific Coast. Rare Chemicals made to order. Instructions given in Assaying and Practical Chemistry

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Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

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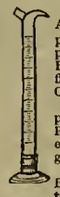

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents for the **Morgan Crucible Co.**, Battersea, England. Also for **E. G. Denniston's** Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.

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NO. 28 STEVENSON STREET,
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Ores worked by any Process.
Ores Sampled.
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No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.

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For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

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Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

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Laundry Free for the use of Families.

HOT AND COLD BATHS FREE.

Terms, Board and Room, $1.00 per Day
And Upward.

Rooms with or without Board.
Free Coach to the House
J. POOLEY.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 3, 1890.

General trade the past week was of the usual holiday character which obtains at this season of the year. It is very generally conceded that the fall trade will be unusually large. This opinion is grounded on light stocks carried by interior dealers, good prices realized by farmers for fruits and prospective good prices for cereals, combined with more activity in the mining districts.

Money is fairly easy considering that tariff and silver legislation are still pending in Congress. The disbursements this month in dividends and interest will aggregate quite large, larger than in July of last year. The mining companies will pay out all of $200,000 less in dividends, but the various interest disbursements will be very large. The demand for money is not quite so pronounced as it was two months ago, but a gradual enlargement in the inquiry for funds is looked for after the present month.

The steamship Oceanic leaving this port on June 26th for Hongkong took out the following treasure: Mexican dollars, $211,175; gold coin, $8696, and gold-dust, $100; total, $219,97r.

MEXICAN DOLLARS—The market has held strong, but at unchanged prices, notwithstanding a slow demand.

SILVER—The local market has ruled quiet throughout the week. That the Mint was out of the market caused holders not pressed for money to withdraw from the market. It is very generally conceded that with the Mint again in the market, which will be next week, higher prices can be secured by sellers. The market has been unfavorably affected by the procrastination of Congress, and also by the general belief that Speaker Reed and the Administration are opposed, as far as practicacle, to legislation that will ultimately result in free coinage. Notwithstanding this opposition, persons in position to know are quite confident that a favorable silver bill will be passed by Congress sometime in this month. There is no disguising the fact that many prominent persons at the East who were formerly opposed to silver, are now looking more favorably upon bimetallism. It is the systematic course of enlightenment pursued by bimetallists that has won to them the many pronounced logical thinkers in this country, and which is also drawing to their standard many abroad who have been outspoken monometallists.

QUICKSILVER—Receipts the past week aggregate 225 flasks, and exports by sea 25 flasks to Sydney and 10 flasks to Auckland. The market continues strong. The supply is reported ample to meet all requirements. Receipts of quicksilver for the first six months aggregated in 1890, 6025 flasks; in 1889, 8205; in 1888, 14,076. The reports by sea and overland railroad for the liketime aggregated in 1890, 3857 flasks; in 1889, 5793; and in 1888, 7226.

BORAX—Receipts last week aggregated 257 ctls. The receipts at this port aggregate for the first six months of 1890 603,800; 1889, 2,505,600, and 1888, 4,398,800. The exports by sea and railroad out of the State aggregate for the like time as follows: 1890, 5,477 lbs; 1889, 3,340,221, and 1888, 2,703,779. The market is fairly steady at current quotations. Eastern advices report an active demand.

ANTIMONY—The market continues strong at full quotations. Eastern mail advices report firm markets.

LEAD—The market is strong. Eastern advices report a strong market, due largely to the reduction in importation of Mexican silver-lead ore. This reduction is about 2000 tons a month.

TIN—The market is strong at a slight advance for plate. The consumption is larger than it was heretofore claimed that it would be. The London advices to June 25th report that market affected by silver. With an advance in the latter metal, tin will do much better.

COPPER—The output on this coast does not show any material increase as yet, but a larger output is looked for the last half of the year. New York mail advices report "that mining companies name 17c as bottom price for Lake Superior Ingots or bars, and the best delivery offered is "July at sellers' convenience." Outside lots may probably be secured at 16¾c, but in limited quantities only. Arizona Ingot does not appear to be obtainable at less than 15½c. There is no unusually large demand for it at the present time, but the product is being used to greater or less extent in the place of Lake Ingot for some purchases, owing to the relatively high cost of the latter. Common casting copper is very firmly held at 14½c and selling very fairly.

A London cable to the *Iron Age* of June 26th reports as follows: Business in copper has continued large, at about £58 10s. for Merchant bars, and the position is steadily growing stronger. Stocks continue to be rapidly reduced, and if the present rate of decrease continues, the supply will be down to a dangerous level by December. When recent sales of American were completed the visible supply in England and France was only 60,000 tons, and the total now is but about 50,000 tons.

IRON—The market is without any essential change to note. The stocks here are liberal, with fair-sized consignments on the way. European advices report a lessening output which is creating a firmer market in England. Eastern advices report an easier undertone, although on the surface business is fairly active.

COAL.—Imports the past week aggregate as follows: From Kohe, 3100 tons, Nanaimo, 834 tons, Comox, 2350 tons, Seattle, 2275 tons; total, 8579 tons. In Cumberland there is an advance of $1 per ton for spot. The demand for steam coals is good, but for gas and household coals the inquiry is only fair. A better inquiry is expected to set in soon for household coals. The Wellington strike is not off yet. Australian coals to arrive are cared for, as are several cargoes now loading. For near shipments the market is strong, but for distant shipments it is easy. English coals for shipment are easier.

UNUSUAL activity is anticipated in Flowery district, Nev., when the litigation now pending is settled, as several mining locations on which work was suspended have pay ore in sight.

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 2.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	47⅞	1 04¼	$16 65	$4 47½	$21 50
Friday	47⅞	1 04¼	16 35	4 52½	21 20
Saturday	47⅞	1 04	16 45	4 50	21 25
Monday	47⅞	1 04	16 60	4 50	21 10
Tuesday	47 9 16	1 03⅞	16 50	4 50	21 00
Wednesday	47 11-16	1 04	16 50	4 47½	20 80

NEW YORK, July 2.—Borax is firm, with light demand, and quoted at 8¾@9c. Copper firm; under qualities advancing. Lake, strong; $16.75 quoted. Actual sales, 75,000 lbs, July and August; Arizona strong, $15.50; casting, $14.76; tending upward. Pig lead held up well under the abundant supply; 200 tons sold at $4.45. Sellers now hold spot at $4.52½@4 55.

San Francisco Metal Market.

WHOLESALE.

	Thursday, July 3, 1890.
ANTIMONY	21@ 21½
BORAX—Refined, in carload lots	8 @ —
Powdered " " "	8 @ —
Concentrated " " "	7½@ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheething	23 @ 25
Ingot, jobbing	20 @ 18½
do, wholesale	17 @ 18
Fire Box Sheets	23 @ 25
LEAD—Pig	4½@ 5½
Bar	5½@ —
Sheet	7 @ —
Pipe	6 @ —
Shot, discount 10% on 600 bags Drop, ₱ bag	1 55 @ —
Buck, ₱ bag	1 75 @ —
Oblled, do	1 95 @ —
QUICKSILVER—By the flask	58 00 @59 00
Flasks, new	@ —
Flasks, old	35 @ —
TINPLATE—B. V., steel grade, 14x20, to arrive	— @ —
B. V., steel grade, 14x20, spot	4 75 @ —
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	6 00 @ —
do, do, 20x28	12 00 @ —
Pig tin, spot, ₱ lb	21 @ 21½
CHROME IRON ORE, ₱ ton	10 00@— —
IRON—Bar, base	3 @ 3½
Norway, base	4½@ 5½
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —

	Spot.	To Load.
IRON—Glengarnock ton	34 00 @ —	33 @ —
Eglinton, ton	34 00 @—	30 @ —
American Soft, No. 1, ton	—@32 00	39 @ —
Oregon Pig, ton	—@33 00	— @ —
Puget Sound	34 00 @—	— @ —
Clay Lane Whites	—@28 00	26 @ —
Sbotts, No. 1	34 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	—@—	—@—
Langloan	34 00 @—	32½@ —
Thorncliffe	34 00 @—	32½@ —
Gartsberrie	34 00 @—	33½@ —
Barrow	34 00 @—	32½@ —
Thomas	33 00 @—	—@—
Cargofleet	30 00 @—	30 @ —

Coal.

	TO LOAD. Per Ton.		Per Ton.
Australian	7 50 @ 7 75	Lehigh Lump	16 50@17 00
Liverpool Steam	8 00 @ 8 25	Cumberland bk	13 50@— —
Scotch Splint	8 25 @8 37½	Egg, hard	15 00@— —
Cardiff	8 50 @— —		

SPOT FROM YARD.

Wellington	$ 9 00	Seattle	6 50
Greta	8 50 @ 9 00	Coos Bay	6 00
Westminster Brymbo	9 00	Cannel	12 00
Nanaimo	9 00	Egg, hard	16 00
Sydney	8 50 @ 9 00	Cumberland, in sacks	16 00
Gilman	6 50	do, bulk	15 00

CANADIAN ANTHRACITE COAL.

Egg, sbip sids	$12 50	Stove, yard	$15 00
Egg, yard	15 00	Nut, yard	15 00

COKE.

English, to load	$12 00@13 00
English, spot, in bulk	13 50@16 00

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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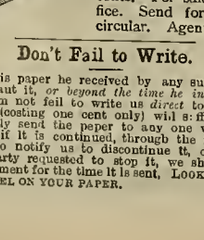

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COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Best & Belcher M Co	Nevada	46	25	May 17	July 8	L C Iborn	309 Montgomery St
Belcher M Co	Nevada	49	50	June 27	July 31	Aug 21	C L Perkins	327 Pine St
Bodie Tunnel Co	California	16	25	May 21	June 25	July 16	C C Harvey	3 3 California St
Bodie Cons M Co	California	12	25	June 16	July 22	Aug 22	B. L. Burling	309 Montgomery St
Challenge Cons M Co	Nevada	6	50	May 14	Jun 17	July 8	C L McCoy	329 Pine St
Confidence S M Co	Nevada	16	75	May 10	Jun 13	July 2	A S Groth	414 California St
Cons New York M Co	Nevada	3	15	May 22	June 26	July 17	C E Elliott	309 Montgomery St
Cons Pacific M Co	California	12	10	Jun 21	July 23	Aug 20	F E Luty	330 Pine St
Crocker M Co	Arizona	9	15	June 15	July 25	Aug 25	N T Messer	309 Montgomery St
Found Treasure M Co	Nevada	6	25	May 28	June 27	July 18	S Stadfeld, Jr	309 Montgomery St
Gray Eagle M Co	California	18	6	July 1	Aug 4	Aug 25	J M Buffington	3 3 California St
Holmes M Co	Nevada	15	25	May 19	Jun 24	July 15	C E Elliott	309 Montgomery St
Mexican M Co	Nevada	40	25	May 13	Jun 13	July 9	C E Elliott	309 Montgomery St
Mayflower Cravel M Co	California	47	30	June 7	July 10	July 31	J Mo Idio	328 Montgomery St
Seg Belcher & Mides Cons M Co	Nevada	6	30	May 5	June 9	June 30	E B Holmes	309 Montgomery St
Sierra Nevada M Co	Nevada	97	50	May 10	Jun 12	July 2	E L Parker	309 Montgomery St
Silver King M Co	Arizona	3	50	June 9	July 17	Aug 11	A Waterman	309 Montgomery St
Standard Cons M Co	California	3	50	June 2	July 15	Aug 14	J W Pew	310 Pine St
True Cons M Co	California	9	2	May 26	July 21	Sept 15	J C Bates	434 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Best & Belcher M Co	Nevada	L Osborn	309 Montgomery St	Annual	July 14
Carmelo Land and Coal Co	California	W T Baggett	415 Montgomery St	Annual	July 21
Overman M Co	Nevada	G D Edwards	414 California St	Annual	July 8
Savage M Co	Nevada	E B Holmes	309 Montgomery St	Annual	July 14
Scott Bar M & M Co	California	H Penk	309 Montgomery St	Annuel	July 7
Union Cons M Co	Nevada	A W Barrows	303 California St	Annual	July 21

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Champion M Co	California	T Wetzel	522 Montgomery St	10	Jan 20
Candelaria Cons M Co	Mexico	G Gato	309 Montgomery St	25	Apr 5
Caledonia M Co	Nevada	A S Cbeminant	328 Montgomery St	08	May 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	Feb 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	Apr 24
Idaho M Co	California		Grass Valley	2 50	Mar 7
Mt Diablo M Co	Nevada	R Heatb	319 Pine St	30	Oct 24
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	July 10

Sales at San Francisco Stock Exchange.

THURSDAY, July 3, 9:30 A.M.

470	Alpha	1.35@1.40	
300	Alta	1.25	
225	Belcher	2.75	
1400	Belle Isle	1.55@1.60	
200	Best & Belcher	2.35	
500	Bodie	1.50	
600	Bullion	3.50@3.55	
100	Bulwer	30c	
300	Challenge	2.75@2 80	
350	Chollar	3.75	
150	Con. Cal. & Va	4.75	
300	Con. New York	40c	
1050	Con. Imperial	4 c	
200	Crocker	15c	
250	Crown Point	2.70@2.75	
180	Gould & Curry	2.30@2.35	
400	Grand Prize	65c	
300	Mexican	2.95	
100	Mono	80c	
200	N. Commonwealth	2.50	
50	Occidental	1.55	
320	Ophir	4.35	
150	Overman	2.55	
250	Potosi	3.12	
600	Savage	3.90@4.00	
300	Seg Belcher	1.70	
250	Sierra Nev	3.20	
180	Union	2.70	
200	West Comstock	30c	
230	Yellow Jacket	2.80@2.85	

Mining Share Market.

The Comstock shares were fairly active at declining prices, up to Tuesday, when the market showed signs of having about touched bottom for the present. On the down grade, which was relieved by short-lived spasms of a revival, the ring had to buy large quantities of stock that were thrown out by the disgruntled public. There is no denying but the general public has no confidence in the stock market, and the ring has itself to blame for this feeling of distrust. If they would work the mines honestly, and not according to bow the stocks are held, then they could make more successful deals. The question now is, can the ring make a deal of any size, with the public feeling as they do? To attempt it they must have a mint of money, in order to take the stock they would be compelled to do at the higher prices that must be advanced. There is no doubt but the ring has large lines of stock that it would like to sell, and to attempt this at a profit, it is natural to conclude that they must advance the market by street points and wasb sales or cross orders on the two stock exchanges. The market closed to-day, Thursday, strong and higher.

In the outside stocks the Tuscarora held steady, but the Bodies made quite a little move, but what for no one appears to know, unless to collect assesments. In both the Bodie and Mono there is nothing new to report, but in the Bulwer they have struck a six-inch vein of good ore. The stock of the first named went up $1 a share, while the latter only advanced five cents a share.

A subscriber is informed that an employer is responsible for the acts of bis employee or agent, and therefore, the best legal advisers in this city say that the officers of a mining company, who are elected by the stockholders of a mine to look after their interests, can be held responsible for any illegal, or other acts of a superintendent of the mine. It is the duty of the officers to look after the workings of the mine, the milling of ore, etc., so as to prevent any stealings, or other wrong acts.

From the Comstocks the news is growing more interesting and encouraging. The Potosi winze is still the gamble. In sinking this winze so as to connect with the drift that is being run from the Ward shaft, the ore is liable to widen out to 10 or 12 feet, or it is liable to pinch out. If it widens then the stocks of Potosi and that the stocks of adjoining mines will advance, but if it pinches out then down they go. It appears to be an even gamble. In Sierra Nevada very interesting work is being done, as there is in Mexican. It is said that they will soon commence running for some rich ore, claimed to lie farther west in Con Virginia. The work going on in Best & Belcher is being closely watched, as that in Hale & Norcross, and that in several of the Gold Hill mines. Latest advices from Savage reported about 14 feet of ore in the 1300 Hale & Norcross north drift, assaying from $40 to $60 a ton. In running this drift they are liable to get in and out of ore a number of times. In Challenge they are said to be in interesting ground. From Yellow Jacket there are vague rumors of a decided improvement. In Crown Point on the 300 east stope they are in from 10 to 12 feet, ore going from $20 to $30 a ton. From Overman and Seg. Belcher good news comes to band; doubtless this is why they broke the stock. In Kentuck they expect soon to have the dead work finished so as to open up the 1000-foot level. On this level there is every encouragement of finding rich ore.

From the Tuscaroras we are advised that the mills will start up soon under favorable conditions. In several of the mines rich ore is being uncovered. From the Bodies there are reports that possibly they may start the mill up on low-grade ore. Owing to the heavy expense of milling, etc., the low-grade ore has not paid. From the Quijotoas the usual rosy-colored reports come to hand.

THE Martinez oannery sent a carload of salmon to St. Paul last week to fill an order that followed the sending to that city of a sample case.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 12.		WEEK ENDING June 19.		WEEK ENDING June 26.		WEEK ENDING July 3.	
Alpha	1.65	1 95	1.45	1.75	1.55	1.70	1 30	1.70
Alta	1.20	1.50	1.25	1.35	1 30	1.40	1.30	1.50
Andes	.80	.90	.70	.85	.75	.85	.65	.85
Belcher	2.85	3.50	2 90	3.35	3.00	3.55	2.50	3.50
Best & Belcher	3.20	3.75	3.40	4.25	3 70	4.25	3 15	4.20
Bullion	2.70	4.20	2.60	3.90	3.25	4.50	3.40	4.15
Bodie Con	.60	.75	.50	.65	.50	.68	.55	1.45
Bulwer	.20	....	....	....	.25	....	.25	.35
Commonwealth	3.55	3.75	3.60	3 70	3 50	3 65	3.55	....
Con. Va. & Cal	4.50	5.00	4.75	6 00	4.85	5.25	4.75	6.25
Challenge	2.40	3.75	2.60	3 50	3.00	3.70	2.60	3.60
Chollar	4.20	4.90	3.40	4.15	4 10	4.85	3.50	4.50
Confidence	6.00	8.75	7.00	7.50	6.75	7.37	6.00	7.25
Con. Imperial	.40	.60	.45	.55	45	.50	.35	.60
Caledonia	.45	.60	.50	.55	.50	.65	.40	.65
Crown Point	2.50	3.75	2.90	3.15	3.00	3.50	2.50	3.45
Crocker	....	....	....	....	.20	....	....	.20
Del Monte	1 10	1.25	1.25	1.50	1.40	1.50	1.40	1.50
Eure a Con	4.00	....	4.00	....	3.95	4.00	....	....
Exchequer	.85	1.50	1.05	1.40	1.30	1.50	.95	1.35
Grand Prize	.55	.65	.60	.70	.55	....	.60	.70
Gould & Curry	2.05	2.80	2.25	3.05	2.75	3.25	2.25	3.15
Hale & Norcross	3.30	3.35	2.55	3.70	3.35	3.85	2 70	3.55
Julia	.40	.45	.35	....	.35	.50	.30	.35
Just co	1.40	1.75	1.45	1.60	1.50	1.75	1.50	1.75
Kentuck	1.50	2.30	1.50	1.90	1.00	1.8	1.25	1.85
Lady Wash	.30	.40	.35	....	.35	.40	.35	.40
Mono	.40	.45	.40	.80	....	....	.45	1.00
Mexican	3.25	3.75	3.10	3.7	3.50	4.15	3 05	4 15
Navajo	.35	.40	.45	....	.40	.50	....	.55
North Belle Isle	1.25	1.60	1.45	1.60	1.30	1.45	1.40	1.50
Nev. Queen	.75	.95	.95	....	.75	.9	.75	.90
Occidental	1.50	1.90	1.50	1.75	1.60	1.85	1.45	1.85
Ophir	4.60	4.90	4.40	4.85	4.60	5.12	4.35	5.12
Overman	2.40	3.00	2 75	2.90	2.65	3.00	2.45	3.30
Potosi	6.87	9.00	5.25	9.50	7.25	10.12	7.62	9.25
Peerless	.25	....	.25	....	.25	....	....	.25
Peer	.30	.35	.25	.30	.25	....	....	.20
Savage	2 15	2.70	2 10	4.25	4.15	5.00	3.80	4.90
Seg. Belcher	1.80	2 25	2.05	2.30	2.15	2 45	1.60	2.10
Sierra Nevada	1.95	3.5	2 95	3.30	3.15	4.15	3.00	4.30
Silver Hill	.45	....	.40	.50	.40	.5	.35	.50
Scorpion	.20	.25	.25	....	.25	....	....	.30
Union Con	2.75	3.35	2.80	3.20	3.00	3.85	2 60	3.80
Utah	.90	1.25	1.00	1.20	1.05	1.40	90	1 40
Yellow Jacket	2 95	3.50	2 85	3.25	3.10	3.50	2.60	3.50

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Mr. A. J. Van Drake's service in this line of business extends over a period of more than 30 years, 20 of which have been passed in this city. Many of the productions of his active brain and cunning handiwork are now in general use, both in the East and on this coast, as he was in earlier years employed in the Bridesburg Arsenal near Philadelphia, and also at the U. S. Mint in this city.

For several years Mr. Van Drake has been engaged in the manufacture of models, fine machine work, electrical appliances, etc., for which purpose he is amply equipped with a force of skilled assistants supplemented by the most perfect machinery. Among these may be mentioned a Brainard milling machine, with cutters costing over $1500, with other machines and tools of corresponding high grade.

Mr. Van Drake enjoys the confidence of those who have had dealings with him in years past, a feature of particular importance to inventors. His works are located at 203 Fremont street.

Tuerk Water Motor.

The Tuerk Hydraulic Power of Chicago, Ill., places an announcement in this issue, calling attention to their water motor. These machines are models of convenience and can be used in many places where other motors are not available. Note their advertisement and write for catalogue, mentioning the PRESS.

COOPER COURTICE of the U. S. Geological Survey has arrived from Washington. He is about to commence an investigation of the fossils found in various parts of the gold belt of California, with a view to determining certain geological questions.

Assessment Notices.

CARMELO LAND AND COAL COMPANY. Location af principal place of business, San Francisco, California; location of works, Monterey county, California.

Notice is hereby given, that at a meeting of the Board af Directors, held on the 4th day of June, 1890, an assessment (No. 1) of Fifty (50c) Cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at tha office of the Company, Room 10, No. 415 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of July, 1890, will ha delinquent and advertised for sale at public auction; and unless payment is made before, will ha sold on SATURDAY, the 9th day of August, 1890, to pay tha delinquent assessment, together with tha costs af advertising and expenses of sale

By order af tha Board of Directors.

W. T. BAGGETT, Secretary.

Office, Room 10, No. 415 Montgomery etract, San Francisco, California.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of Works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of July, 1890, an assessment, No. 18, of 6 cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon whieb this assessment shall remain unpaid on the 4th day of August, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 25th day of August, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

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DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, June 30, 1890 At a meeting of the Board of Directors of the abovanamed Company, held this day, a Dividend (No. 33) of One Dollar ($1.00) per share was declared, payable THURSDAY, July 10, 1890, at the office of the Company, Na. 230 Montgomery Street, Rooms 11 and 12. Transfer Books close July 5, 1890, at 3 o'clock P. M.

ALTON H. CLOUGH, Secretary.

DIVIDEND NOTICE.

The German Savings and Loan Society,
526 California Street.

For the half-year ending June 30, 1890, a dividend has been declared at tae rate af fiva and forty-hundredths (5 40-100) per cent per annum on Term Deposits, and four and one-half (4½) per cent per annum on Ordinary Deposits. Payable on and after Tuesday, July 1, 1890.

GEO. TOURNY, Secretary.

DIVIDEND NOTICE.

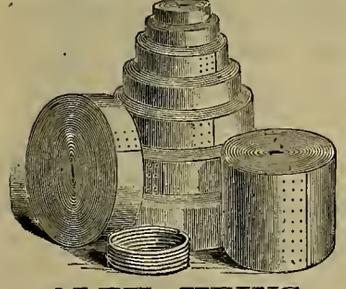
SAN FRANCISCO SAVINGS UNION, 532 California Street, corner Webb; BRANCH, 1700 Market Street, corner Polk.—For the half-year ending with 30th June, 1890, a dividend has been declared at the rate of five and four-tenths (5 4-10) per cent per annum on term deposits and four and one-half (4½) per cent per annum on ordinary deposits, free of taxes, payable on and after TUESDAY, 1st July, 1890.

LOVELL WHITE, Cashier.

ANNUAL MEETING.

THE ANNUAL MEETING OF THE STOCKHOLDERS af the Carmelo Land and Coal Company, for the election of a Board of Directors to serve the ensuing year, and for such other business as may come before the meeting, will be held at the office of the Company, Room 10, No. 415 Montgomery street, on MONDAY, the 21st day of July, 1890, at one o'clock P. M.

W. T. BAGGETT, Secretary.



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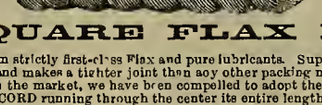

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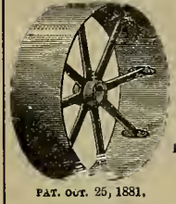

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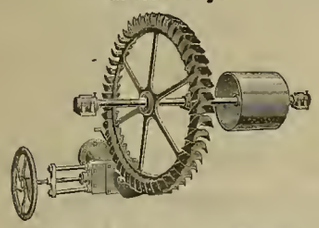

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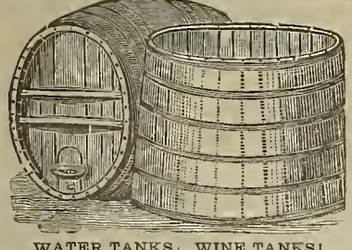

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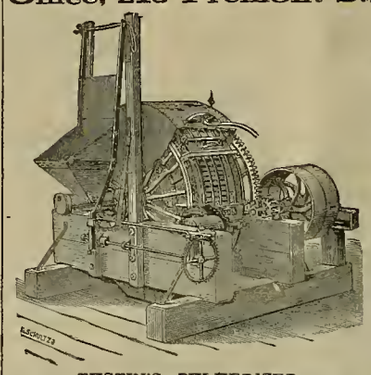

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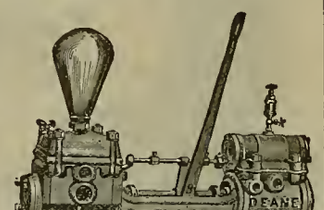

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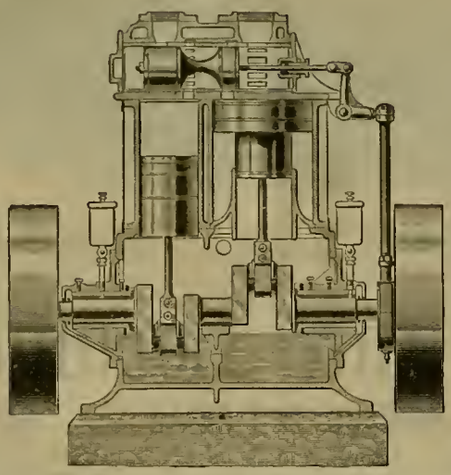

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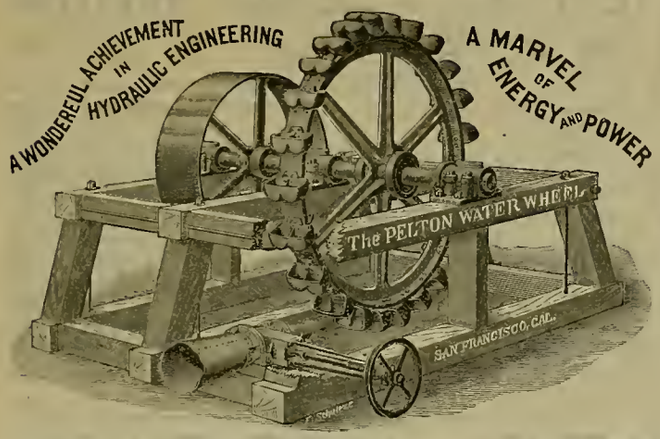
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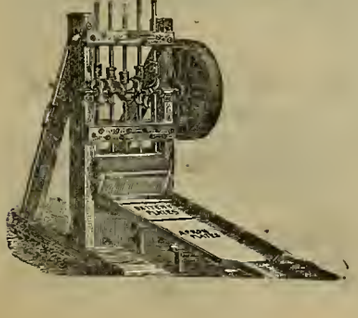

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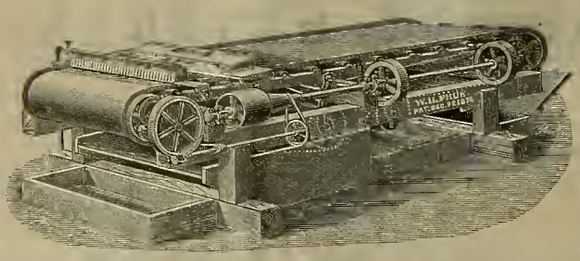

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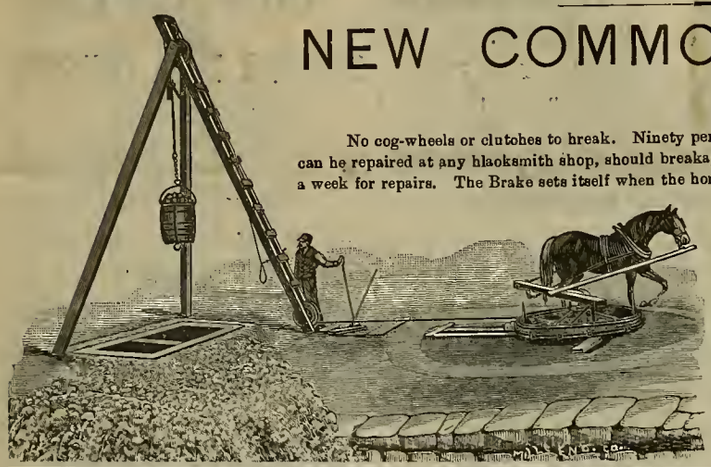

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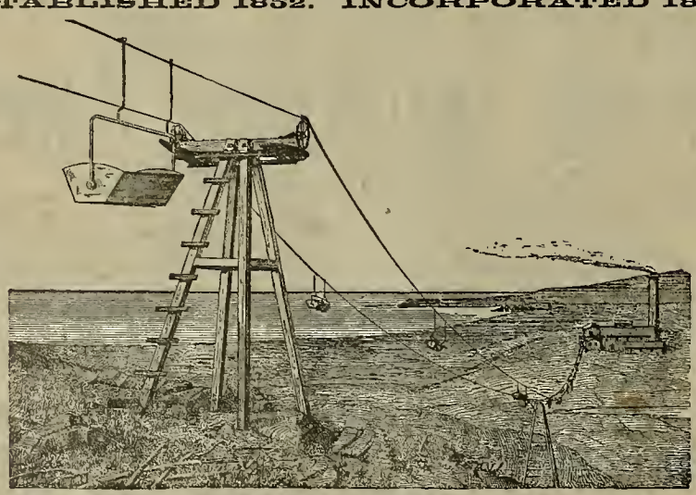

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VOL. LXI.—Number 2.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, JULY 12, 1890.

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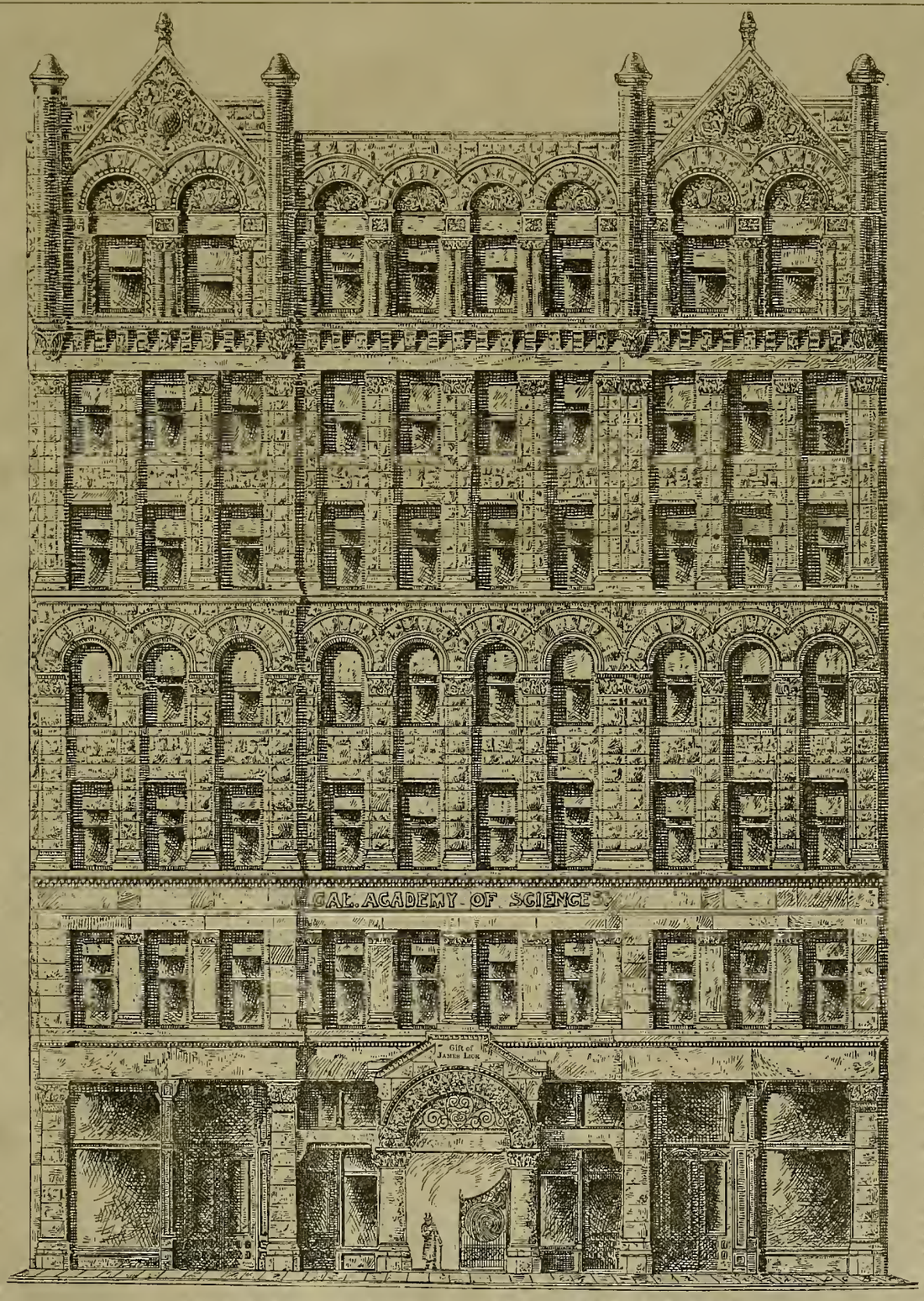
Single Copies, 10 Cts.

Academy of Sciences Building.

The late James Lick, among his many other benefactions, deeded to the California Academy of Sciences, some time before his death, a fine building lot on Market street, near Fourth. This is 80 feet front; it is 195 feet deep on one side and 275 feet on the other, being triangular at the rear end where it adjoins the lot of the Society of California Pioneers. The Academy of Sciences, being residuary legatees of the Lick estate, will receive some $300,000 or $400,000 in money on the settlement of the estate, and have obtained from the Lick trustees sufficient money to put up a very fine building, which is by far the best for scientific purposes on this side of the continent. In fact the Academy will shortly be better housed than any similar institution in the United States, thanks to the liberality of Mr. Lick.

On this page is presented an engraving of the new building now rapidly approaching completion. It was designed by Percy & Hamilton, architects, and is seven stories, or 112 feet, in hight. The building almost covers the entire lot, the exception being in the rear where the sharp angle of the triangle is cut off and the back wall of the new building forms an acute angle with the existing oblique wall of the Pioneer building, in order to permit of the insertion of windows along that side.

The entire front is of stone, for the first two stories gray granite, and for the upper ones sandstone in two colors. The accompanying sketch shows the character of the frontage. The ornamentation in the gables and other parts is in keeping with the objects for which the building is intended. Rich carvings at the cornices, pillar-caps, arches and pediment add greatly to the appearance of the building and make its substantial and durable stone front a thing of architectural beauty. The four walls really inclose two separate buildings, one an income-paying property of stores and offices, seven stories high, and the other behind it devoted entirely to the needs of the academy, a six-story structure. Immediately behind the rear wall of the front building is a light-well 27 feet in width and as long as the lot is wide, 80 feet, rising from the second story up, still more effectually marks the separation of the two buildings. The main and only entrance to both front and rear structure is from the Market-street front by a lofty, wide hallway, dividing the ground floor of the seven-story building into two parts for its entire length. The front building stands on the lot 80x88 feet, and will consist of stores and offices. There are four stores, a large and small one on each side of the entrance, the former being 20 feet wide in front and 31 feet in the rear, and the latter of small depth with a frontage of about 13 feet each. The offices of the upper floors are fitted as most modern offices are, electric wire bells, calls and all other customary conveniences being introduced in their proper places.



THE NEW BUILDING OF THE CALIFORNIA ACADEMY OF SCIENCES.

The finish is wood for the wainscoting of the corridors, doors and windows, as well as to some extent inside the different apartments. The partition walls inside the second story are of what is termed "slow-burning" or fire-resisting material.

The hallway on the ground floor is 12 feet wide, the entrance archway being elaborately carved and supported on double columns of polished granite, affording great depth and an imposing appearance. The floor is laid in colored tiles of picturesque design. The wainscoting for a hight of ten feet is of marble, and from that hight to the ceiling the walls are of different colored patent bricks with small arches and pilasters in relief. On the right side of the hallway, a marble and iron staircase six feet wide rises, and opposite it is a passenger elevator. The entire shaft is built in with brick walls

(*Continued on page 24.*)

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Gold Belt of Northern California.

Ancient River Channels and Gravel Deposits.

NUMBER V.

[Written for the MINING AND SCIENTIFIC PRESS by JAMES F. TALBOTT, Shady Run, Placer Co.]

A short distance above is Prospect Cut (so named from the men working in the cut in grading the road, prospecting the gravel on their shovels and finding colors of gold). The view of the deposit in this cut, from the cars, is now obstructed by the snowshed over the track.

The lower end of the cut is in bedrock, which rises 100 feet above the railroad in a short distance to the south. The deposit consists of seven distinct layers deposited with great regularity in horizontal strata, each one of which is composed of different materials, with lines of connection as definitely marked as if made with a painter's brush in different colors, all forming the bank on the north side of the cut, 100 feet above the track.

About midway the cut is seen the first or bottom stratum on the bedrock, level with the track, composed of a solid light blue clay 15 feet thick, with many large volcanic bowlders imbedded in it. The next stratum above is a lava wash forming a kind of cement of rotten cobbles and bowlders about 20 feet thick. The deposit above this is a granite wash—sand, gravel, cobbles and bowlders, 20 feet thick. Some of the granite bowlders in this stratum are from five to ten feet in diameter.

This is suggestive of the time when this ancient channel was filling up from the granite country beyond Bear valley, for it is a well-known fact that there is not a foot of granite bedrock in place within 15 or 20 miles in any direction from this point.

On top of this granite wash is a deposit of a reddish-yellow clay, 15 feet thick, without a gravel or bowlder in it. Above this is a thin layer of white pipeclay. The next stratum is a mixture of coarse gray sand and light-colored clay ten feet thick. On top of this comes the main lava capping that caps the olimax. The margin of the lava has been graded off back to the depth of 20 or 30 feet. The character of the deposits inside the rimrock, as seen in the railroad cuts here described, is proof positive of the existence of a deep and extensive ancient channel in this ridge; and the method of deposit indicates in terms as positive the co-existence of the volcanic, the damming or blocking up and the eroding periods—alternating lava flows and floods. Here is seen the volcanic mud flow that forms the cement, a lava deposit on top of it. Then the water-worn gravel and bowlders, brought down by the succeeding flood and deposited on top of the lava. Then comes a commingled rush of lava flood that completely blocked up the channel below Prospect Cut.

The indications are that the lava ceased to flow for a time, and during this interval the floods got in their work, the result of which is seen in the deposits at Prospect Cut, and the numerous steep gulches, some of which have cut back inside the rimrock and carried away a portion of the deposits, leaving almost perpendicular cliffs of cement and lava. These and the deep gorge through which Blue Canyon now runs, are the unmistakable evidences of the modern erosions in action at the same time.

From Prospect Cut the railroad runs through bedrock cuts to within about a mile below the station of Blue Canyon, where it strikes into the lava, through a bluff point of which it runs in a tunnel about 500 feet in length. There are but few indications along here that would attract the notice of a superficial observer. Some quartz gravel and bowlders with a light sprinkle of gold, have been shoved over the rim, a little below the railroad track at China Ranch. A short distance above, where the railroad crosses the Cedar creek ditch, the cement is seen to crop out at the last point on this side the ridge.

This is a significant fact in support of the theory here advanced, when considered in connection with the surrounding conditions.

Here the Lava Flow

That is seen to cap the cement all along this ridge for miles below this point, crosses through to the North or Bear river side of the ridge. In exactly the same way, and through corresponding sections, three townships or about 20 miles to the south, the lava flow above Michigan Bluff crosses through the Forest Hill ridge to Damascus.

From the town of Blue Canyon the railroad curves around and cuts through high barren bedrock points, all the way to Emigrant Gap, where it leaves the gold belt of this section and climbs the steep and rugged mountains of bedrock and lava, to bring to view the wonders beyond.

To the south and intervening between this point where the lava crosses through the Shady Run ridge and Damascus, are Blue Canyon, the north and south branches of the North Fork, three deep canyons and two high barren bedrock ridges, and not a vestige of lava is seen between the two points. This fact alone precludes the possibility of any ancient channel crossing from this ridge to Damascus, as a great many mining experts have heretofore theorized. Before commencing a description of the north, or Canyon creek side of the ridge, I will briefly notice that portion of the channel that extends from the Hogsback, where the C. P. R. R. crosses through the ridge to Bogus Point (so named from a few rich spots, but no regular pay being found). This portion of the channel is about three miles in length, confined in a narrow gorge known as Moody ridge, between Canyon creek and the North Fork. A heavy lava cap covers the gravel and bowlder deposit, as shown at Bogus Point, where the channel gravel and lava have all been carried away by the present North Fork, similar to the channel of the Forest Hill ridge by the Middle Fork, below Spring Garden, as no traces of lava are found below this point. The high bluff of bedrock to the north of Giant's Gap, forms the south rim of the channel. On the Canyon creek side the rim rock extends well up to the top of the ridge in places, showing a lava deposit, at the widest point, about a mile in width and 500 or 600 feet in depth, inside the bedrock walls. Tracing the rim rock up on the south side of Canyon creek, we find just before reaching the Hogsback a narrow break from the ridge that lets out some of the gravel which formed a small deposit about Alta. A short distance above this break the bedrock rises above the C. P. R. R., as seen where it crosses the Canyon creek at Towles.

Following the same method, from the same motives adopted on the other side of the ridge, though not quite so comfortable, but with better opportunity for observation, we will put some dry goods boxes for seats on a flat car, take aboard the commission of geologists and mining experts to examine the north, or Canyon creek and Bear river, side of the Shady Run ridge, along Towle's narrow-gauge road. You will observe before we start that the track is on solid bedrock about 30 feet above the O. P. track, and a glance to the westward will show you that a spur of the same rises 100 feet above the track and extends half-way down to Alta. All aboard, off breaks, and we follow this spur of bedrock up on the

North Side of Canyon Creek,

About a mile, where it dips under a deposit of cement at Damagnard's old sawmill. Some small patches of nice-looking, fine gravel show along here. This body of cement undoubtedly extends through the ridge to Shady Run, as it is near the same level and capped with 500 or 600 feet of lava, as seen from this point on the south side of Canyon creek. The distance through is just a mile, or across one section. The indications are that at this point is an extensive break in the rim to the west, the outlet from which formed the gravel deposit of the Alta mine. This outlet unites with the one from the Hogsback, somewhere about Alta, and takes a northwest course toward Little Bear river, and formed the deposit at Nary Red. From this break-up to Towle's old Alabama mill, about a mile, the upper rim appears to have been carried away a little below the level of Canyon creek and considerable gravel carried over it and deposited about the head of Little Bear river. It is observed here that a spur of bedrock runs up between Little and the main Bear rivers. At the Alabama mill a deep and extensive break has occurred. A heavy body of cement is seen, capped with a spur of lava that has been cut off from the main ridge by Canyon creek. The outlet of this break extends in a northwest course to the main Bear river above the spur of bedrock referred to. On the south side of Bear river, on the line of the Gold Run branch of the South Yuba ditch, is seen a wall of cement and lava 200 feet high. Only a short distance from this point, above and below, the ditch runs in bedrock. The biggest pay ever found on Bear river was at Buffalo Slide, in the vicinity of this outlet.

A Short Distance Above

The Alabama mill, we come to where the Cedar creek ditch dumps the water into Canyon creek from the tunnel through the ridge just below Prospect Cut. Here we are about on a level with, and not more than half a mile from, the C. P. R. R., and a solid lava ridge 300 or 400 feet high is all that intervenes between the two roads. From this point, Towle's road runs to the northward some distance up Canyon creek, then ascends the bedrock ridge between Canyon creek and Bear river, crosses the summit and descends, in its serpentine course, over deep gulches and through abrupt bedrock spurs, to Bear River mill. From the mill, it climbs the steep, rough mountain of bedrock that forms the south rim of the channel in the Nevada ridge, north of Bear river. From where Towle's road descends the north side of the ridge between Canyon creek and Bear river, you will follow the Gold Run branch of the South Yuba ditch, or Culbertson's wagon road which is several hundred feet above the ditch, to get a correct idea of the high bedrock country lying between the Shady Run ridge and Bear river. For five or six miles along here there is not a trace of channel gravel or lava north of Canyon creek. The first appearance of any gravel or lava above is about the head of Dry creek. Some fine-looking gravel is seen on the South Yuba ditch and in some of the ravines. Here is a very

Extensive Break in the Rim

To the west—the last break on this side of the ridge—the outlet of which is into Bear river, about the old emigrant crossing. Many rich spots of pay, in coarse gold, have been found below, in the old channels of Bear river, some 20 or 30 feet below the present bed of the river. No pay has ever been found in the river above emigrant crossing. About the head of Dry creek, in one ravine, some pay was got, nuggets worth from $5 to $10 being found. A tunnel has been run here 500 or 600 feet, in a southeast course toward the lava ridge. The deposit on the bedrock is principally quartz gravel and small-sized bowlders intermixed with small pieces of flat slate bedrock, indicating beyond a doubt a deposit from a break, from the channel in the ridge, through the rimrock. From Dry creek, the Yuba ditch runs in bedrock to Bear valley—distance about three miles—and the Culbertson road, high above the ditch, runs on bedrock also. Scarcely a color of gold can be found in any gulch or ravine between Dry creek and Bear valley. It is from about the head of Dry creek where the channel runs through to the south side of the ridge, where it appears below Blue Canyon.

The Present Bear River

For several miles along here appears to have been cut out through a high barren bedrock country, lying between, or, that formed west rim of the Shady Run and Nevada Ridge channels. The bedrock rises abruptly from the river on either side. On the south, above Dry creek, it rises several hundred feet above the Culbertson road, and extends up to the lower end of Bear valley, where it dips to the east under a bed of lava, as seen on the south side of the valley.

On the north side of the river, just above Liberty Hill, the bedrock runs to the top of the ridge about on a level with the lava capping and extends unbroken (except one point where there is a break in the rim that formed a small gravel deposit known as Kinder's diggins) up to the lower end of Bear valley, where it dips—as on the south side—to the east under the wall of lava 800 feet high. This is seen just back of Jim Davies' house, on the north side of the valley. Near the lower end of the valley will be observed a reef of bedrock extending across from hill to hill. Going up the valley about half a mile one can see the decaying remains of a prospect plant. Here, 25 or 30 years ago, a company spent $10,000 to get down 80 feet into a bed of bowlders, for a little fine gold. Bedrock was not reached. Going up to the valley about half a mile farther you come to Jim Davies'. If you are dry you can get a glass of clear, cold water, that comes from 100 feet beneath the surface, out of the well in front of his house. No bedrock found here. I was told by Mr. Tompkins, who formerly owned the place and sunk this well, that the material passed through in sinking is a dark sandy loam, and from a few feet below the surface could be easily removed with a shovel. The most remarkable thing is the entire absence of any gravel or bowlders. A short distance above this well, you can see a few bedrock reefs crop out above the surface, running across the valley. Further up and to the east you will see spurs projecting out from either side, and rising from 50 to 100 feet above the valley. From those spurs to the east, the bedrock rises gradually for some distance, then ascends abruptly to the top of the hill, where it can be traced from Emigrant Gap, along the C. P. R. R. and north to and far beyond the South Yuba river 1000 feet above Bear valley and east of any gravel mines in this portion of the gold belt. Having traced

The Rimrock of the Channel

In the Shady Run Ridge, from Bogus Point to Bear valley, shown its extent and given the facts in regard to the conditions observed, I will now give the figures that define its course. Following the main lava flow inside the rimrock walls we see on the south side of Bear valley, in the southeast corner of Township 17 North, Range 11 East, altitude 4400 feet, a deposit of lava from 800 to 1000 feet high, above the level of the valley. This lava capping or flow enters from this point into the northeast corner of Township 16 North, Range 11 East, crosses diagonally through and out at the southwest corner, where it enters the northeast corner of Township 15 North, Range 10 East, about where the C. P. R. R. cuts through the ridge at Hogsback. From this point the flow continues the same course to Bogus Point, about the center of the last named township, altitude about 3000 feet. Where the lava channel and everything was carried away by the present North Fork, this lava flow can be definitely traced all the way from Bear valley to Bogus Point, within the lateral limits of every section through which it passes. There are but few places on the ridge where it is more than a mile in width. Several lateral spurs project from the main flow toward Bear river and Canyon creek, but the main flow is continuous in the course above stated, except a gap where the C. P. R. R. cuts through the ridge, there all of the lava and a portion of the cement has been carried away, on the south towards Green valley, on the north towards Alta. The conditions observed at Bear valley require more than a passing notice on account of the connection of the two ridges. The term "Divide," as used in this article, includes the country drained by one of the ancient rivers and tributaries, and the gravel deposits connected with them, independent of any other one. It will be perceived then, that the North Fork Divide is formed by the two main ridges uniting at Bear valley, there being no indications of any channel east of this point. The high bedrock country to the east and at the upper end of the valley, to the north, and the bedrock gorge through which Bear river now runs, to the west, has puzzled the most intelligent and practical mining experts of the Nevada Ridge. There appears to be a missing link here that the gold-hunter, with his magic dowsing-rod and hazel crotch, has failed to discover. About midway in Bear valley no bedrock has been found at the depth of 100 feet. At this point, about half a mile apart, rises on either side of the valley a wall of lava, 800 feet high. Evidence is abundant on every hand of some mighty flood that cut the gap through this bed of lava. It is evident no great amount of flood waters could accumulate from the drainage slope of the present Bear river, as it heads to the east in the gulches and ravines in the immediate vicinity, almost within rifle shot of the valley, at a standpoint where the south Yuba flume emerges from a gorge into the northeast portion of the valley. Looking to the northeast you can see coming toward you, on a direct line with the main Bear valley, the surging waters of the South Yuba river, roaring through the narrow gorges, with perpendicular and overhanging walls of solid granite hundreds of feet high. Leaping over and plunging around massive granite bowlders, the river comes down opposite, and but 200 or 300 feet beneath your feet, and here makes an abrupt bend to the northward and runs for miles in a gorge cut down 2000 feet in the solid bedrock. From all of the surroundings, it is obvious those floods were from the watershed, and that at no very remote period of time the waters of the South Yuba flowed down the channels in the Shady Run and Nevada Ridges.

(*To be Continued*)

The Mines of El Dorado County.

NUMBER II.

[By Our Own Correspondent]

Kalaay.

The Big Sandy quartz mine is operated by a Toledo company, with Mr. J. H. Beatty as superintendent. The property is opened by an open cut and tunnel on the large vein. The ten-stamp mill is running on their $2 ore. A shaft is going down to test the vein; so far the great size of the vein has not required a greater depth of working than 20 feet.

Dalmatia Mine.

This property is operated by a London syndicate, with Geo. C. Pearson as manager and N. H. Husband (formerly of the Eureka of Custer county, Col.) as superintendent. The vein is a huge mineralized dyke of porphyry, with quartz seams, and to all appearances is similar to the seam mines of the county. The mine is opened by tunnel and shafts which cut the ore body 200 feet deep. A crosscut 190 feet long has not reached the wall. The ores are mined by contract and delivered at the mill for 7½ cents a ton. This is made possible by reason of the large body of ore and its loose body character.

The mill is equipped with three Huntingtons, crushing 25 tons a day each, and ten stamps crushing 25 tons per day, making the capacity of the mill 100 tons every 24 hours. The Dalmatia is an exceptional property in several ways. First, in this: that their ore is *mined and milled for fifty cents a ton.* This a realization of things long hoped for by mining men.

While all mines may not contain as large bodies of ore so easily excavated still it opens up an unlimited amount of mining property low in grade, which at the present time is not worked in consequence of the expense exceeding the ore's value. This economy in the working of the Dalmatia mine ores is due to the fact that this property enjoys the distinction of being the first quartz mine in the State

Run by Electricity.

The electric plant is of the Brush patent. One mile from the mill the waters of Rock creek are carried down the American river and here 400 inches are turned on to a 7-foot Pelton wheel, with a pressure of 112½ feet. An electric generator of 126 horse-power is connected with the Pelton wheel. From this generator two wires run up over the mountain to its summit, and at the Dalmatia mill, one mile distant from the generator, connects with an electric motor or dynamo in the mill. From a pulley on the dynamo a belt carries the power direct to the main shaft. It seems almost incredible that the two small wires leading down to the dynamo should carry in them such wonderful power, and none the less wonderful that so small a dynamo should drive this large mill with its rock-breaker, three Huntingtons and 10 stamps, with perfect ease and not consume all its power. The company will now connect the old 20-stamp Gopher Boulder mill with the same wires and run it with their surplus power, making their capacity 150 tons a day. The mill has a complete electric light plant, with turbine wheels or three nozzles on the Peltons. A 30-foot fall will drive a dynamo, and the same water can be used continually as it flows down a river. In this way power can be created on any stream sufficient to drive all the mills within miles. It solves several problems. First, it reduces the cost in every instance; then, too, it allows the placing of the mill in any particular locality. It overcomes the difficulties attending the operating of a mine in those sections where wood and water are scarce, and while it saves all of the expense of water for boiler and fuel for heat it allows all of the water, in dry countries, to be used

for the batteries. There is scarcely any limit to the possibilities attending the use of electric power in mining, and it promises to be to the mining industry as great an advance as the steam engine over horse-power. No one contemplating the use of electricity should allow the fact that at this plant a large body of water under a great head is used, to discourage them, as the plant does not require either the quantity or pressure here used. The company had the water and the fall to use it. A visit of inspection will well repay any mining man, and I expect to see the Dalmatia the Mecca to which all progressive California mining men will be journeying in the near future.

Garden Valley.

The operations of the Taylor mine have infused new life into this section, and there is now every reason to believe that within another year this will be one of the best mining camps on the mother lode in the State. The mines are here. All they want is to be operated on the same scale, and to be as carefully equipped as in the Taylor, now known as the Idlewild G. M. Co. The main working shaft is down 500 feet on the vein, which runs from 4 to 30 feet. Previous millings of the ore gave an average of $8 a ton.

The mill has twenty 950-pound stamps, and is built to allow the placing of an additional 20 stamps. The ores are concentrated by the Woodbury concentrator, one concentrator to each battery, or four in all. Power is furnished by three Pelton wheels. The mill throughout is a model, and it would be a difficult matter to excel it. If there is any fault, it is this: the hoist is in the mill. This, while it is the rule should be the exception as in the case of any accident or fire, it is well nigh impossible to get the men out of the shaft. Messers. Hayward & Hobart make it a rule in all of their mines to have the hoist out in the clear with nothing but the frame over the shaft, and I think it would pay other mining men to follow their example. The Taylor system of water-supply is somewhat original in this, that lacking a site for reservoir to store surplus water, they have constructed a canal 800 feet long, 10 feet wide, and 6 feet deep along the summit of the mountain to act as a reservoir; this gives them a steady supply and 310 feet pressure at the mill.

Mr. E. W. Chapman is manager and Mr. W. E Denison, formerly of the Coffee creek hydraulic mine of Trinity county, superintendent.

The Reservation mine joins the Taylor, and is held under bond by them. The mine has a complete mill, and will, no doubt, be put in operation this season.

The Emma

Joins the Reservation. Mr. Bell, the owner, has for years past worked this mine for its pocket ore, sinking shafts over 100 feet deep single-handed. Now that the Taylor is coming to the front, he has every reason to believe that his property will prove a milling proposition. Up to this time he has confined himself to the quartz seams in the dyke occupying the lode.

The Lone Jack

Adjoins the Emma. This mine is opened to a depth of 416 feet, with a drift south of 100 and north of 80 feet on a ten foot vein. At present the mine and ten-stamp mill are idle, but will start up now that they can handle the water. Mr. H. Lawrence, formerly of the New Brunswick antimony mine, is superintendent.

Esparanza.

Mr. N. O. Burlingham is superintendent and has put the shaft down 200 feet and crosscut, showing the vein to be 54 feet between walls of ore that will mill $5 a ton. The ores carry one per cent of sulphurets running from $90 to $540 a ton.

Ivanhoa and Eclipse.

Mr. Fletter, of the California Cap Co., is operating the mines Ivanhoe and Eclipse. The work is all on the Ivanhoe. The vein has a diorite hanging and talc slate wall, with an exceptionally fine gouge. Throughout the length of the Ivanhoe numerous cuts and shafts show a strong vein. The main working shaft is down 200 feet. The mine has a complete hoist in good order, and only needs capital to make the property one of the best in the section. The former operators sunk 200 feet and then drifted 50 feet into the hard diorite hanging wall. The foot wall was not crossed to, nor was there any drift run on the vein. At other points on the vein the ore shows its mineral character, and throughout its entire course, with its croppings of from two to 20 feet, gives every indication of a good mine.

I know of no property where a small amount of money intelligently applied will be so apt to show up a good mine, and the property can be secured for a nominal sum, with privilege of first developing. El Dorado has a very promising future in her mining industry. Her past history is about to be repeated, and the quartz mines find the same El Dorado that first, through Marshall's discovery, drew attention to the gold of California. E. H. SCHAEFFLE.

THE proposition of incorporating several mining locations in Silver City district, Nev., and listing the stock on the San Francisco Stock and Exchange Board, is again being considered, now that the rate for listing has been reduced to one-half the former cost. So far none of the locations in that district have been explored to a depth of 500 feet except the Dayton and Kosmth.

San Bernardino County.

Its Mineral and Other Resources.

NUMBER I.

[Written for the PRESS by JAMES H. CROSSMAN.]

San Bernardino is the banner county of our State in area, if not in population and taxable property. It has within its boundaries all the elements of prosperity in great abundance. Its mineral and agricultural resources are probably unsurpassed by any county in our State. The division line is boldly and distinctly defined by that mountain chain known as the San Bernardino range. That portion best adapted to agricultural pursuits lies to the south, which is not void of mineral wealth, but the mineral region proper that forms the metallic domain of this county lies to the north of this mountain range. The northerly boundary of San Bernardino county is Inyo county, with the State of Nevada on the northeast, while the Colorado river which divides the State from the Territory of Arizona, forms its Eastern boundary. It is bounded on the south by San Diego county, while Los Angeles and Kern lie to the west. It contains within these boundary lines 23,476 square miles. Much of the largest portion of this area lies north and east of the San Bernardino range, of which there are of mountains and agricultural lands 6000 square miles, and of the so called "desert land" we find 17,476 square miles, a large portion of which is susceptible of cultivation, providing storage reservoirs, and artesian water can be obtained.

The Valley of San Bernardino,

Upon which Dame Nature has with such a liberal hand bestowed her bounteous gifts and blandest smiles, is already noted far and wide for its fertility of soil and picturesque landscape. It is situated directly east of the city of Los Angeles and about 50 miles south of west from the nearest point to the Pacific seaboard. The valley proper has a length east and west of about 60 miles, with an average width of 15 miles. We find here a varied combination of both soil and climate. It is here that the orange attains a greater degree of perfection than in any other locality on the Pacific Coast, as can also be said of all the varieties of deciduous and citrus fruits that are adapted to a semi-tropical clime. Clover, alfalfa, barley, wheat, oats, as well as every vegetable known to man, yield abundant crops of a superior quality. Walnuts, almonds, chestnuts, filberts, peanuts and pecans are also products of this favored soil, while the raisins grown beneath the benificent rays of the semi-tropical sun have a national reputation. It is the home of the grape. The wine manufactured in this county is highly esteemed and commanded a good price both at home and abroad.

Cities and Towns.

Outside of the city of San Bernardino are many beautiful and attractive suburban towns. The most prominent are Redlands, Lugonia, Riverside, Gladysta, Crafton, Banning, Mentone, Highland, Harlem, Old San Bernardino, Sunny Slope, Colton, Etiwanda, Rialto, Urbita, Cucamonga, Beaumont, Ontario, Terracina, Mound City, Chino, Rincon, South Riverside, East Riverside and Hermosa.

The climate in the valley is mild and equable, the thermometer seldom reaching the freezing point. About 17 inches of rain is the average.

Artesian Water

Can be obtained in many places both north and south of the San Bernardino range in both desert and valley. In the latter, 121 artesian wells alone furnish 13,000,000 gallons every 24 hours, while the combined annual flow is several billions. In San Bernardino and the adjoining valley over 400 of these streams are unceasingly contributing their quota of living water pure and crystalline. The pipes are from 2 to 12 inches in diameter; 300 wells are within the city limits. The principal source of supply to the Gage canal and irrigation system is drawn from this source. In addition to the supply from creeks and wells, reservoirs for the purpose of storing water have been built in the mountains. The lake formed by the Bear Valley dam makes the largest storing reservoir in State for irrigation purposes. We have taken the liberty of publishing the following description of this dam written by Elsen D Hall for the San Bernardino Board of Trade and published by that deserving institution illustrative of the resources of the county, at the same time acknowledging our obligations to Mr. J. C. Scott, secretary of that institution, for information and favors extended.

The Bear Valley Dam

Is located at the outlet of the Bear Valley into Bear creek, which empties into the Santa Ana about five miles below, and is one of the most favorable locations that could have been selected. The valley is surrounded by mountains, and has no other outlet but this, which here is very narrow with precipitous rocky sides. Into the solid rocks of this gorge the dam is abutted, and is built on a curve, arching inward, forming the arc of a circle, with a diameter of 345 feet. Its dimensions are: On top, 300 feet from abutments, 60 feet high from the bedrock of the creek in the highest point, and it conforms to the mountain slope on either side. Its base is 20 feet wide, and from this it slopes to three feet wide at the top. Its average coefficient of safety is 25, and it would stand twenty times its present pressure. The whole is built of vast granite blocks which were quarried near the margin of the lake and floated to the wall on scows, while a derrick built on a floating raft took them and placed them in position. The rocks were laid in Portland cement and all the interstices were filled with beton. The cement had to be hauled in wagons from Colton by way of the Cajon Pass and Mojave Desert, and thence down the valley to the dam, a distance of 100 miles. A four-horse team hauled eight barrels and it took ten days to make a round trip. Sixteen hundred barrels of cement were put into the dam at a cost of $13 per barrel, including the freightage.

The engineer was F. E. Brown of Redlands. The State Engineer of California has pronounced the work not only efficient but a remarkable piece of engineering.

The lake formed by the dam extends back into Bear valley over five miles, with an average width of nearly a mile, and a depth of 12 feet, and contains the enormous amount of 8,000,000,000 gallons. To supply this the valley furnishes over 60 square miles of drainage area, on which falls three times the amount of water which the lower valleys receive. The dam stands 6400 feet above sea level. The quantity of water held in reserve now is sufficient to irrigate 50,000 acres of land, and to supply a population of 500,000 with water for domestic purposes. Much water still goes to waste in Bear valley and elsewhere in the mountains. The capacity of this reservoir will be enlarged. Other dams will be built. Nowhere else in Southern California does so much rain and snow fall as on the San Bernardino mountains. The unfailing creek and rivers, the large number of flowing artesian wells, and the limitless supply of water in the lofty mountain valleys, which may be had for the expense of storage reservoirs, unite to make San Bernardino the best watered county in Southern California, we might almost say in the State.

The waters from Bear valley and other supplies in the mountains find their way by natural channels to the plains. At the mouth of the canyons, stone-lined ditches, flumes, and cement pipes convey the supply to the cultivated tracts. The best method of irrigating is to have a distributing reservoir into which the stream can run continuously, and be drawn upon as needed. Fruit lands need irrigating only about once in four to six weeks. After the ground is thoroughly soaked, two or three days are allowed to elapse before it is gone over with a horse cultivator. The surface of the ground is thus prevented from baking, and the moisture is retained for several weeks.

Transportation Facilities.

Two transcontinental railroads pass through the county, which, with the advent of the extension of the Utah Southern (now in process of construction at least as far as Pioche in Nevada) through the heart of the desert mineral region to some point on the Atlantic & Pacific R. R. or to tide water, would make three roads. These, with the California Central and the San Bernardino Valley R. R. now building, will make San Bernardino a railroad center of great importance. At date, San Bernardino is also the banner railroad county of the State, at least so far as mileage and county assessments are concerned. There are 417 miles of standard-gauge road and 321 miles of motor and narrow-gauge, with 21 miles of electric roads within its boundaries. These several companies pay assessments on $4,991,250, the value of the available railroad property in the State being $26,000,000.

Though the metallic domain proper lies to the north of the San Bernardino range, its valley region is not devoid of mineral wealth. The ores of tin of great value and immense quantity occur in the Temescal range of mountains, on the San Jacinto ranch; there are also mineral paint, gypsum, bituminous rock and coal measures. There has also been found a stone suitable for macadamizing streets. The manufacture of tiles and brick from a superior quality of fire-clay is an important and a growing industry.

Statistical.

For the following statistical data I am also indebted to I. C. Scott, Esq., Secretary of the Board of Trade of San Bernardino, and to Mr. Hale.

The tax levy for the year 1890 is $1.50 on the $100. The county is free from debt.

Acreage under cultivation for the year 1889, 64,410. The principal products were as follows:

	Value.
310,000 boxes oranges	$744,000
4,250 boxes lemons and limes	17,000
325,000 boxes raisins	546,250
650 tons dried fruit	143,000
40,000 cases canned goods	160,000
90,000 lbs. English walnuts and almonds	6,750
345,000 lbs. comb and extracted honey	23,300
240,000 gallons wines and brandy	63,000
275,000 centals barley	146, 50
Wheat, oats, hay, and other products	100,000
Total	$1,949,050
Minerals	1,350,000
Grand total	$3,299,050

Mr. Scott also states in his report to the Board of Trade for the fiscal year ending December, 1889, that the earnings of the county will average more than $100 to each man, woman and child in the county.

The above statistics, which can be relied upon as correct, show that San Bernardino county, taken from a financial standpoint, is now the leading county of the southern portion of the State. If she can do this with her paucity of inhabitants and undeveloped resources, what can she do with her plans for irrigation works completed, unimproved lands under cultivation and her desert regions pouring forth their treasures of mineral and metallic wealth.

Minerals in the Desert Regions.

From its present arid condition but little of the territory is suitable for agricultural purposes, without the assistance of artesian wells or storage reservoirs; but Mother Nature, ever prodigal, has sown broadcast over this dry region, immense stores of mineral wealth, rendering it the home of the miner and prospector, the advance guard of civilization. Of the many minerals and metals known, useful to man, there are very few that cannot be found in abundance, bituminous and carbonaceous products the exception. Intense volcanic action has destroyed all vestiges of inflammable materials, and the rocky structure shows everywhere the evidence of intense heat. At a very recent period in the geological history of the world, volcanic cones that ejected rivers of molten lava were in existence. The evolution of powerful gases and thermal waters through cracks, seams and fissures in the earth's crust, have, through chemical action on its mineral contents, metamorphosed and colored them with the bright hues of the rainbow, and all of their several shades harmoniously blended. The colors are vivid and pronounced; yellow, blue, black, red and white, with their several combinations and shades of purple, pink, lilac, green, brown, etc., the rocky structure either standing in vertical strata or on inclined planes, with thousands of acres of colored earth lying in a horizontal position at the base of the cliff, derived from the decomposition of the rock in places. The short mountain chains and isolated peaks, with which the desert region is dotted, are fissured with metalliferous veins of extraordinary richness. Here are gold-bearing veins, and veins charged with silver combinations. Copper is found in both a metallic form and as carbonates, oxides and sulphides. The ores of lead are found in veins and deposits of great strength and purity. The oxide of tin (cassiterite) is found, in placer, in immense quantities. San Bernardino, at no distant day, will be to the United States what Cornwall has been to Great Britain.

The most valuable of all of the ores of iron magnetites occurs in the Mojave district, enclosed in vein-shaped fissures from 20 to 100 feet in width, this ore assaying from 60 to 85 per cent metallic iron, free from phosphates of sulphur, only requiring the "iron horse" for transportation of the ore to fuel or of fuel to the ore, rendering us independent of the foreign product. There are alkaline earths and saline products, soda and borax, in inexhaustible quantities, the latter not only on and near the surface as an efflorescence but in vein-shaped deposits of remarkable purity and great strength. Full particulars of this remarkable deposit will be given under its appropriate head. These minerals and their metallic products with cheap means of transportation will eventually prove very profitable. The discovery and production of borax that abounds in this region was the factor that reduced its price from 65c. to 6½c. per pound, its present quotation. Large surface areas are covered with rock salt that penetrate to unknown depths and are of a crystalization so pure that a printed page can be read through a cube of one foot of this product. The wagon road from Mojave to Furnace creek, built by Coleman & Co. for hauling borax from their mines in Death Valley to rail, was compelled to use cutting tools for a considerable distance before they could haul their wagons over this rough, hummocky saline material. Granite, marble and sandstone for structural and ornamental purposes can be found of a superior quality in this county. Asbestos and mineral earths suitable for paints are known to exist; and niter is reported to have been discovered. This immense treasure-house of metallic and mineral wealth has heretofore been but little developed for want of cheap transportation.

(To be Continued.)

MINING is very active in Montana. It is estimated by competent miners that there is double the amount of work being done on the quartz claims in the vicinity of Butte than during any previous year since quartz was discovered in that vicinity. Especially is this true of the locations north of the city, where at least 150 are in course of development, two-thirds of which are paying propositions. As for the others, all that is necessary to make them such is development work, which is progressing as fast as steam and horse-power can accomplish it.

ANOTHER CHANCE FOR INVENTORS.—There is considerable complaint in some quarters about the annoying, rattling noise caused by the operating of type-writing machines, and it is positively disagreeable to persons in the same room who are compelled to tolerate it continually every day. There is no reason why a noiselessly operated machine should not be constructed. Let the inventors solve the problem.

EUGENE B. BURDICK, a well known mining man, formerly of Nevada but now superintendent of the Equator mine, near Placerville, El Dorado county, is visiting in this city. Mr. Burdick's recognized mining ability has been more than confirmed in the success he has met in opening up the Equator mine.

THE Hueneme *Herald* says there are 110 flowing artesian wells in that valley.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

QUARTZ.—Amador *Ledger*, July 5: A correspondent says that Monro Anise, while hunting stock in the vicinity of Quartz mountain, stumbled across a quartz ledge which promises to revolutionize mining in that neighborhood. Samples of the ore have been assayed, showing free gold in paying quantities, and sulphurets above the average. Three blasts of giant powder developed a ledge four feet wide on top, with slate for footwall, and a hanging-wall almost perpendicular. The lead has been traced for 1700 yards, and runs east and west.

CLINTON PEAK.—Messrs. Stevenson & Gutman of San Francisco have bonded of S. G. Spagnoli a tract of mining ground at Clinton, known as Clinton Peak. It is proposed to extend the tunnel now existing on the claim a distance of 150 or 200 feet farther. There is a quartz ledge from 8 to 10 feet wide, but the quality of the rock has never been tested by mill process. It is claimed by some that it will yield at least $4 per ton. Three men were started to work on the tunnel Monday morning. The Bingham mill, Pioneer district, is running on rock from Greisback's claim, with good results. It is thought it will prove a success. Two dollars per ton is charged for crushing. The batteries for the quartz-mill at the McKenzie mine passed through Jackson Thursday.

Fresno.

STRIKE IN THE HARRON.—*Expositor*, July 2: For nearly 30 years has old man James Harron's mine across what is known as the table and northeast of old Fort Miller in the Auberry valley, been crudely worked with varying fortunes to its owners. The mine is situated about 28 miles east of north from Fresno. It was worked before Harron became its owner many years ago. The claim was purchased from Mr. Harron by W. L. L. Witt and John C. Hoxey. In the summer of 1889 A. M. Clark and W. H. McKenzie, of the firm of Clark & McKenzie, bought an undivided interest in the mine from Mr. Witt and Mr. Hoxie, and proceeded to work it on a much larger scale than ever before known. The main vein of the Harron mine is composed of free milling gold quartz and varies in width from six to ten inches. During the score and a half years of mining operations in the valley this vein has been skimmed over by its various owners for 3000 feet, and in nearly every instance profit has accrued. The present company has sunk two shafts, each 100 feet in depth and four feet apart, to encounter the somewhat broken ledge. The methods of milling the ore are of the most primitive character, and comprise two arastras, to run which and get out the quartz, from five to ten men are constantly employed. This morning an *Expositor* reporter hearing that a rich body of ore, yielding $500 a ton had been struck in Auberry valley, he called upon Mr. Clark to ascertain the truth or falsity of the report. "Yes," said Mr. Clark, "about five or six days ago we struck a body of ore which goes $500 to the ton. In our judgment our prospects look very bright, but I don't care to have much noise made about it. The ore was struck near the old works and about 70 feet from the surface." In our drifting and stoping we have all along found free gold, giving from $75 to $400, and in some instances $500 a ton. The vein containing the gold is from six to ten inches wide. In many places the ledge is wider than this, but we don't care to work it, as it isn't profitable to do so. Mr. Witt is superintendent of the mine." The news of the strike has created considerable excitement in mining circles, and it in conjunction with the reported finding of the mother lode at Grub Gulch, is destined to give a boom to the industry.

Inyo.

PROSPECTING. — *Index*, July 2: Phil Cartier and Jo Diaz have started on a prospecting tour in the mountains far to the east of Independence. They fitted out for an absence of several months. Their objective point is a silver-lead prospect discovered by Mr. Cartier some time ago, samples of which assayed high in the hundreds.

Napa.

QUICKSILVER. — *Calistogian*, July 2: In the Black Bear quicksilver mine, where C. H. Nash, T. C. Brown and another miner have been working the past few weeks, the shaft is now down 60 feet. A drift from the shaft to the ore will soon be made.

Mono.

THE BODIE CON.—Bodie *Miner*, July 1: During the past week the winze from north drift, 200 level, was extended nine feet. Upraise from north intermediate drift above 400-foot level, was extended 9 feet. West crosscut from main north drift, 700 level, was extended 22 feet. There were employed nine miners and one foreman, and jointly with the Mono the west crosscut from south drift, 700-foot level, was extended 11 feet. There were employed two miners, one engineer, one carman and blacksmith, one assayer and carpenter, one watchman and one foreman.

MONO.—During the past week, jointly with Bodie, the west crosscut from south drift, 700 level, was extended 11 feet.

Nevada.

WASHINGTON.—Cor. Nevada *Transcript*, July 3: The Washington mine and mill at this place closed down to-day for a short time on account of shortage of water for pumping purposes. New steam hoisting works will be erected to take the place of water. Some immensely rich rock has just been taken out of this mine, and there is but little doubt that in the near future it will prove one of the most valuable mines in the county. The indications are strongly in favor of this outcome.

PEABODY.—*Tidings*, July 2: Monday evening Supt. Tilley brought to town some quartz specimens from the ledge in the Peabody shaft. The specimens included gold in crystalized quartz and gold in a band of quartz running through a piece of wall rock. Gold is also shown in quartz beautifully mineralized otherwise. The specimens are the handsomest seen here for some time, and coming as they do from the ledge in the shaft, on which sinking was recently instituted, verify our statements to the effect that we would not be surprised to bear of rich ore being extracted any time after sinking was commenced. The ledge is between three and four feet in size and aside from the specimens affords every indication of yielding profitably. The depth of the shaft is 215 feet. We expect to hear of these strikes in the Peabody occasionally, and the rich spots are just as likely to yield high up in the thousands as in the hundreds of dollars.

Placer.

THE ECLIPSE MINE.—*Republican*, July 2: The Eclipse ledge in Ophir district was first worked by Mexicans with an arastra in 1854. Nick Maring then worked it profitably for a time, but water which he could not manage caused him to abandon it. A. Shurtleff located the claim in 1869, and J. B. Patterson, the present superintendent, bought him out in 1870. Litigation followed, and the property was practically idle until a year ago last April. In the spring of 1889, C. A. Poage a capitalist of New York, became interested in the property and supplied the sinews of war for its development on modern lines of mining. Mr. Patterson has all along remained its active manager, and he put up what is doubtless the finest quartz-mill in Placer county. The building cost about $5000 and the machinery more than as much more. It contains ten stamps, but has room enough for ten more which will be put in this summer. There are also two Frue concentrators, and ample space has been provided to duplicate these as soon as the additional ten stamps are in place. The machinery is all run with Pelton wheels, and water from the Bear river ditch, which costs 12½ cents an inch by the year and is brought to the mill through 1000 feet of 15-inch pipe. Everything about the mill is new and complete. The Eclipse ledge is now being systematically worked under the direction of Ben Dunstan, foreman. The shaft is 250 feet deep, and it would almost be called an incline, since the ledge lies at an angle of about 30 degrees, and is comparatively flat. First-class hoisting works with a Cornish pump are over the shaft, and a small car attached to a cable drops you down into the mine. The quartz is good milling ore, and when a connection is made with the 130-foot level there will be plenty of good air all through the mine. The mill has been run steadily for about eight weeks; two cleanups have been made on about 350 tons of ore. The number of men employed at the Eclipse is about 30; the miners work eight-hour shifts and receive $3 a day. The ownership is vested in a stock company in which Mr. Patterson and Mr. Poage own the majority of stock. Mr. Pack, formerly connected with the San Francisco Mint, is assayer at the mine and has charge of the mill.

San Bernardino.

BLACK HAWK. — *Times-Index*, July 5: The Black Hawk mine started up on Monday last under the general management of Alex. Del Mar and the superintendency of Harry Del Mar. A force of 50 men were put at work for a starter. This move bids fair to make San Bernardino famous as a mineral-producing county.

San Diego.

MINES AND OWNERS. — Julian *Sentinel*, July 4: The mines that are now being worked in the camp are: The Owens, owned by King & Williams; the High Peak, owned by Barnett & Co.; the Gardner, owned by Robert Gardner; the Gold King and Queen, owned by the Gold King M. & M. Co.; the Helvetia, owned by Hubbell & Havermale; the Kentuck S., owned by the Julian G. M. & M. Co. of St. Louis; the Ready Relief and South Hubbard, owned by the Bailey Bros.; the Cincinnati Belle, owned by St. Louis parties; the Warlock, owned by Walker & Bell, and the famous Stonewall, owned by Gov. Waterman. Many smaller properties are being prospected, and many more are lying idle for want of capital.

THE MINING OUTLOOK of this camp is all that could be desired. Every individual and company is getting down to solid work. There are no idle men in camp, rich ledges are being uncovered, machinery is coming in. Investors are arriving to look the ground over and pick up "soft snaps," the croakers are disappearing and a general feeling of permanent prosperity pervades the camp. Some of our most prosperous ranchers have abandoned the plow and cultivator to take up the hammer and drill.

Siskiyou.

CINNABAR.—Yreka *Journal*, July 2: The Cinnabar mines on the west branch of Beaver creek, in the Siskiyou foothills, near the Oregon line, are to be worked on an extensive scale this summer, men of capital having bonded them with the intention of putting up new machinery, improved retorts and other necessary apparatus for securing quicksilver. The men engaged in developing these cinnabar claims, as well as on Beaver creek are experienced quicksilver miners, and will no doubt meet with the greatest success.

HYDRAULIC.—The Campbell hydraulic mine at Quicksilver Valley, and the hydraulic mines at Oro Fino, are all in successful operation, with an abundance of water to keep the miners busy day and night. About $21,000 in bullion from the Salmon river section was brought here last week for shipment below, and nearly $8000 was brought here yesterday from Know Nothing creek quartz mines in same section for similar purpose. The Salmon river mines, both quartz and placer, are turning out exceedingly rich this season. The river miners along the Klamath in the Honolulu section are all beginning to take out pay gravel, and down below at Oak Bar, will also be ready to do so after the Fourth, as their wing dams are about completed.

NEVADA.

Washoe District.

SIERRA NEVADA.—Virginia *Chronicle*, July 5: On the 630 level the west crosscut from the southwest drift, 600 feet from the shaft station, is advanced 374 feet, the face continuing in soft porphyry.

UNION CON.—On the 1465 level from the north lateral drift, opposite west crosscut No. 4, east crosscut No. 1 is advanced 537 feet. Continuing in porphyry and clay.

MEXICAN.—On the 1465 level at a point 70 feet south from west crosscut No. 4, west crosscut No. 5 is advanced 197 feet, continuing in soft porphyry.

OPHIR.—On the 1300 level the winze at a point 50 feet southwest of the raise is down 50 feet, cutting out station for a hoist engine.

CON. CALIFORNIA & VIRGINIA.—The 1300 and 1500 levels continue to yield the usual quantity of ore. There has been extracted during the week, from all parts of the mine 2367 tons and 430 pounds of ore. Shipped to the Morgan mill 97 tons and 440 pounds of ore and to the Eureka, 1490 tons and 1990 pounds; battery sample assays showing an average value of $18.23 per ton; [26 tons milled.] Sbipped bullion valued at $38,596.66 to the Carson Mint. On hand in assay office about $55,000.

SCORPION.—The southwest drift from the 660 level shaft station is advanced 655 feet and continues in clay and porphyry.

ANDES.—On the 420 level the north drift from west crosscut No. 2 is in 59 feet; formation quartz and porphyry.

SAVAGE.—Sbipped 495 tons of ore, showing an average value of $19.45 by battery sample assays.

HALE & NORCROSS.—Shipped 1102 tons of ore during the week, showing an average value of $20 per ton by battery sample assays. Bullion on hand valued at about $64,467.84.

WARD COMBINATION SHAFT.—The 1800 level east drift is out 490 feet; the face continues in porphyry.

CHOLLAR.—Extracted 500 tons of ore, battery sample assays showing a value of $22 per ton.

POTOSI.—On the 850 level east crosscut No. 4, 400 feet south of the north line is in 250 feet. The winze is down 212 feet on the slope below the 930 level, the bottom in fair-grade ore.

ALPHA.—The 600 level east crosscut is in 230 feet; the face continues in quartz. The 600 level west crosscut is in 298 feet, the face in quartz.

EXCHEQUER.—The 500 level north line east crosscut is in 296 feet, and continues in quartz and porphyry.

CON. NEW YORK.—The north drift from the top of the raise above the 800 level is out 120 feet; the face continues in low-grade quartz.

SILVER HILL.—The east drift from the winze below the 800 level is out 110 feet, the face showing bunches of quartz.

IMPERIAL. — The joint Confidence-Challenge 1000 level west crosscut No. 2 is in 169 feet, the face in low-grade quartz.

YELLOW JACKET.—Shipped 500 tons of ore showing average assay value of $20.50 by battery sample assays.

CROWN POINT.—Sbipped during the week 795 tons of ore, showing an average value of $17.08 per ton by pulp assays.

CONFIDENCE AND CHALLENGE.—The joint Imperial 1000 level north drift, from west crosscut No. 1 is out 118 feet, the face in low-grade quartz.

BELCHER.—The 1300 level east crosscut is showing streaks of quartz. The 850 level west crosscut is in 60 feet, quartz showing in the face.

SEG. BELCHER.—The raise above the 1000 level east crosscut No. 1 is up 140 feet, the top continuing in low-grade quartz.

JUSTICE.—During the week crushed 190 tons of ore showing a value of $27.50 per ton by battery sample assays.

ALTA.—The ore output this week was 360 tons, showing an average assay value of $23 per ton by pulp assays.

OVERMAN.—Shipped 485 tons of ore during the week showing an average value of $23.50 per ton by battery sample assays. The northwest drift continues in low-grade quartz. The incline winze is still sbowing ore.

UTAH.—On the 725 level the incline raise is up 185 feet above the south drift and has connected with the 600 level west crosscut. This connection forms an important airway.

OCCIDENTAL CON.—The 650 level main north drift is extended 170 feet, sbowing low-grade quartz. Crosscut No. 2 from the end of the drift is showing bunches of ore.

BEST & BELCHER.—On the 1000 level joint west crosscut No. 1 is extended 425 feet. Formation, hard porphyry. On the 1200 level west crosscut No. 4 is extended 63 feet. Formation, soft porphyry.

GOULD & CURRY.—On the 400 level the northwest drift is extended 165 feet. Formation, soft porphyry with streaks of quartz.

Cottonwood District.

NICKEL MINE.—Reese River *Reveille*, July 5: The lumber for the hoarding-house at the nickel mine on Cottonwood canyon has arrived on the ground, and the managers of the property expect to have the plant ready inside of two months to reduce the ore. Quite a number of men are now employed in extracting ore, there being about 500 tons of high-grade ore on the dump.

Eureka District.

ORE SHIPMENTS.—*Sentinel*, July 5: During the past week, the Eureka & Palisade railroad company shipped 390 tons of ore to the Salt Lake City smelters; also 155 tons of lead, making the entire shipments for the month of June 1455 tons.

Ely District.

THE PEACOCK.—White Pine *News*, July 2: Last Saturday, at the invitation of D. C. McQuitty, Major Treece and the *News* scribe jumped into his carryall and were driven across the valley and up the foothill grade to within 500 yards of the Peacock mine. Ten minutes' walk up a rather steep grade brought us to the mine. The flattering reports that had reached us from time to time of this new discovery, and of which mention has several times been made in the *News*, were more than corroborated by an inspection of the property and the surrounding formation. The outcroppings of this new discovery are a bold, regular, well defined quartzite, running east and west, with not a trace of lime to be found. Three openings have been made on the ledge, some distance apart, and the vein matter shows a brittle, decomposed quartz, carrying free gold that in some pieces of the rock can be seen with the naked eye. There is no question but that the vein is a true fissure, in fact, we have never seen so well defined a ledge in this county, except perhaps in the Star mine at Cherry creek. The cropping shows ledge matter for at least a width of 20 feet. The owners are now sinking a 6x6 foot shaft on the ledge, and were down 12 feet at the time of our visit. The material they are taking from the shaft is a lively quartz that will probably mill all through $20 per ton. The lowest assay made was $3, and the highest $130. Intermediate assays range between $10 and $50. But the owners are building no air castles on a high-grade mine. What they believe they have—and what all the indications warrant them in believing—is that they will open up an immense mine of $15 to $20 ore. The locators and owners of this promising property are: David Dennett, Thos. Johnson, Newton Boyd, A. G. McQuitty, J. R. McQuitty and D. C. McQuitty. The Peacock mine is situated about 7½ miles and a little north of east from Ely, in the foothills of the Schell Creek range.

Morey District.

RICH ORE.—Belmont *Courier*, July 3: The Morey M. Co.'s mine continues to yield rich ore. They have about 10 tons of silver ore in sacks that assays $2000 to the ton.

Pioche District.

ZERO.—Pioche *Record*, July 3: This is one of the claims of the P. C. Company lying south of the Raymond shaft, located on the manganese ledge there. In addition to the tunnel run last winter from the woodyard level at the Raymond Works, the company has a shaft on the vein 150 feet deep and are taking out a large quantity of fair quality ore. A 50-ton ore bin has just been erected, and the work is prosecuted by means of compressed air from the Raymond Works. Burleigh drills were used until a few days ago, when, on account of the comparative softness of the ground hand drilling was adopted. The company entertain great hopes of opening up a valuable property in this part of their possessions, and apparently not without good reason, the ledge at the bottom of the shaft now carrying three and a half feet of ore, two feet of which averages 108 ounces in silver, and one foot and a half 60 ounces, all free working ore.

HALF-MOON MINES.— The working force here now consists of 12 men, one-half of whom only are taking out ore, the others doing pure development work. Since our last mention the southeast or Re se tunnel has been run some 80 feet where the ledge now averages 20 inches in width, and from this point only all the Half-moon ore needed at the furnace is now taken, averaging 12 tons a day and assaying 29 ounces silver, 18 per cent lead and $9 in gold. Work continues on the north tunnel which is now in over 600 feet, and it is expected that 150 feet more on the north branch of it will be necessary to cut the ledge a second time. This tunnel will be used to work the ore from the southeast or Reese tunnel. The property looks well and is so developed now that 80 men could be put at work on ore at once if necessary.

Robinson District.

PROSPECTING.—White Pine *News*, July 2: A great deal of prospecting has been done in Robinson district so far this season, and the result has been satisfactory all around. There are now a dozen mines in the district fairly developed, and if their owners only had milling facilities they would ask no odds of any mining magnate in the world. But this is the last obstacle the prospector has to encounter. First he finds the mine, then he works it—sometimes for years—to show that he has it; but he may have ever so much pay ore, if it is not high grade enough to ship a thousand miles by wagon and rail he is but little better off than the first day he started out in the hills to look for the precious metal. There is great wealth of the precious metal in this district, and the work of the hardy prospectors for the past few months has brought much of it to light. What a pity that the mining experts who were here last winter, when everything was covered with snow, could not see our district now with the greatly improved features it presents. We may have to wait awhile, but the time will surely come when Robinson district, despite all drawbacks, will make its mark as a great gold producer. The mineral is here and it will be taken out.

ARIZONA.

NOTES.—Prescott *Journal-Miner*, July 5: Two pack trains arrived yesterday from the Bradshaw mountains with ore for the sampling works. The Oro Bella Co. will commence immediately prospecting for a water supply with which to run their mill. The Kansas City M. Co. have 11 men engaged in sinking a new shaft on the Silver King mine. They are now down to a depth of over 100 feet, and in good ore. Rich shipping ore was struck Thursday night last in the new shaft of the Silver King mine. With several shots put off Friday it improved, both in quantity and quality. The Silver King people are correspondingly jubilant over it. The Cinnabar claims of G. K. W. and R. C. McNary, in Copper Basin, continue to improve as development is made. Our correspondent at Camp Senator writes that surveys have been made recently there of the ground on which it is proposed to erect the new ten-stamp mill and concentrating works of the company. Machinery for this mill is now en route from Chicago. Two carloads of machinery arrived last night for the Copper Basin M. Co. It consists of a leaching machine and concentrating plant, and is an item of considerable significance to this country, as it means that the plant will be erected immediately in Copper Basin, and the camp started up in full blast. It is estimated that within three months from 200 to 300 men will be employed in Copper Basin.

COLORADO.

THE BUSHWHACKER AND ALPINE. — Aspen *Times*, July 3: The Taylor & Brunton tunnel people, when securing right of way for their tunnel through Smuggler mountain, neglected to secure right of way through the Bushwhacker and Alpine claims, then being operated by B. Clark Wheeler and others, and now controlled by the Bushwhacker M. Co. The tunnel company's contracts and rights extend as far as the Bushwbacker side line. It will be necessary for the tunnel company to make terms with the Bushwhacker company in order to make more than 1500 feet of their tunnel available on and along the great mineral run or contact. A co-operative contract will be of mutual benefit to the companies. The mining company desires to hoist ore from below the tunnel level by means of electric power, and to slide mineral down their incline from the levels above the line of the tunnel to the amount of millions of dollars, while the tunnel company must have right of way through the mining claims to satisfy the London stockholders, and to reap a reasonable reward on tolls for the transportation of mineral from the Bushwhacker and Alpine. Each company can do without the other, but a mutual contract will be of great value to both. The next property beyond the Alpine and Bushwhacker, on the line of the contact, is that of Iowa, Joplin and Cascade, controlled by the Iowa & Smuggler Mountain

M. Co. Manager B. Clark Wheeler says that his company will make an equitable contract with the tunnel company, if properly approached, after the Bushwhacker company arranges to give them right of way. Smuggler mountain will eventually produce many million dollars worth of mineral. When the Mollie Gibson, Standard, Park-Regent, Bushwhacker, Iowa, Empire, Champion and Mineral Farm properties are considered, the future for them and the great water-line tunnel is assured, and the owners of the properties will reap great wealth from their development.

DAKOTA.

COST OF THE BABY SMELTER.—Deadwood *Pioneer*, July 2: The cost of the D. & D. smelter has been greatly underestimated, as shown by the sworn statement of Mr. A. W. Coe. The cost of grading, building, etc., exclusive of grounds, machinery and freight on machinery, was $7798.32. The ground cost $4500, and adding machinery and freight, the total cost was not less than $15,000.

CHLORINATION WORKS.—The whole of the machinery from top to bottom, including the two recently lined roasters, was in operation yesterday, and running as smooth as could be desired. The men are all well trained to their several duties, and none are idle. Enlarging to a 50 or 60-ton plant is contemplated. All that is required is an additional chlorination tub, and this will reduce the cost of treatment to about $4 per ton. The process is a success and a gold saver.

IDAHO.

LOOKING WELL.—Idaho *Avalanche*, July 2: The Phillips & Sullivan mine is now looking better than ever, the lode being large and the ore proportionately rich. This mine has always produced good ore, a large quantity of which yet remains in sight.

WAGONTOWN.—The mines at Wagontown are all looking splendidly so far as worked; the more development work performed on them the better they look, especially as depth is attained. The Sommercamp Group is holding its own, and if anything, getting better. Very rich ore is now being taken from the winze being sunk on the large lode of this group. The Garfield is also holding the same rich ore that it did ten days since, much of which is being extracted for shipment.

CHAUTAUQUA.—This is one of the lodes comprising the Lepley group of mines, about half a mile northwesterly from the Wilson. The lode is now having development work performed upon it.

NYMPH is the name of a location owned by Mr. John Allington, Capt. G. B. Weeks and Mr. Dennis Sullivan. It is situated up what is known as Tom Wall's gulch. It is said to be about 50 feet wide. Work has been done in crosscutting, to tap the lode, for several months, and the end of the crosscut is yet fully 30 feet from the lode, but in a mass of iron.

STONDARD.—Work is still progressing in this mine, a drift being driven on the lode, which averages about 12 feet in width, carrying a great amount of low-grade gold ore.

THE Wilson mine is producing its usual amount of ore, keeping the DeLamar mill pounding away day and night. The ore is as good as usual, and is producing bullion right along.

LOWER CALIFORNIA.

NEW MACHINERY FOR ALAMO.—*Lower Californian*, July 3: The Princesa Co. at Alamo received on the Newbern from S. F. last week a big lot of machinery which will give mining in the camp a new impetus and increase the output of gold from the Princesa mines five-fold. The machinery includes a Knowles pump capable of throwing a four-inch stream, which is sufficient to drain any of the mines and render it easy to extract large quantities of rich ore. Besides the pump there are two boilers, one weighing five tons and of 50-horse power, one of 35-horse power, several trucks for carrying ore from the levels to the main shaft, an engine and various other machinery. The Princesa Co. is making solid progress under the wise management of Supt. H. W. Rodda, who is employing all modern contrivances to render the enterprise profitable to its owners.

PROSPEROUS.—Every little while a man is found who predicts the failure of the Alamo mines within a certain time, usually about three months, but the mines refuse to give out. The camp is highly prosperous and all indications point to its permanency.

THE CEDROS ISLAND MINE.—The Pacheco arrived this morning from Cedros with 2502 sacks of ore and nine passengers for San Diego. The steamer came in in a dense fog and literally felt her way up to the wharf from a point below Todos Santos island. She was compelled to leave 500 sacks of ore at Cedros, as the large force of men now at work at the mine are getting out ore faster than it can be transported, and four 4-mule teams are kept busy hauling to the steamer landing, a distance of three miles. Sixty-three men are employed in the mine and business is humming. New discoveries of gold and silver ore are reported on the island.

MONTANA.

ALICE.—*Inter-Mountain*, July 2: This mine is today in the hight of its glory, with every stamp dropping and silver ranging at the 1.06 figure. Developments are progressing on the 1300, 1200 and 1000 foot levels, and it may be said of a most favorable character under a superintendent whose mining capabilities has been the cause of bringing the Alice to its prominence as a bullion-producer, and its stability among the mines of the camp.

MEADERVILLE.—There are a number of small mines in the vicinity of Meaderville that are receiving the attention of leasers. From their continued operations and the pleasing countenances of those who have risked their chances on the uncertainty of mining, one is impelled to believe that all are prospering. It has been circulated that the boys in the Gambetta have met with some favorable indication in the bottom. All in connection with this property have been fortunate enough to strike it rich, all being hard-working young men. If they have a bonanza it is only what they deserve.

LOWLAND DISTRICT.—It is rumored that the Columbia mine is to be disposed of. This is the mine upon which James Coonan is erecting an arastra. It is about completed and ready to commence operations. The Ruby is in with the tunnel a distance of 530 feet, and the workmen expect to encounter the lead almost any day. This will give backs for stoping about 130 feet and will tend considerably to determine the value of the ledge as the shaft was sunk only a depth of 100 feet. Floyd, Brannigan & Co. are progressing favorably with their flume that is used for floating wood to Bernice. They are handling about 500 cords every 24 hours.

THE B. & B.'S 400-TON CONCENTRATOR.—The Butte & Boston Co. has contracted with Fraser & Chalmers to erect a 400-ton concentrator at Butte, near the smelter. The power will be derived from a 200-h. p. Corliss engine. The ore will be crushed by crushers and rollers, the lack of sufficient water preventing the erection of a steam stamp. The ore after crushing will be seiged both by trommels and hydraulic separators. After passing the jigs, the fine slimes will be treated on 20 Frue vanners. All the water will have to be pumped, and it is proposed to put in a Root rotary pump. The hight the water has to be raised is 75 feet. Before deciding on the pump best suited for this work, Supt. Palmer inspected the Root pump at the concentrator of the Butte Reduction Works. This pump raises 1200 gallons of water per minute a hight of 45 feet, and has been running constantly without a single breakdown for nearly a year.

NEW MEXICO.

LAST CHANCE SOLD.—Silver City *Sentinel* July 2: Through the indefatigable labors of John M. Wright, the Last Chance mine at Silver Creek, which was bonded last December, has been finally sold and cash purchase price of $25,000 was on last Saturday paid to the former owners, James Connery and Martin Johnson. The Last Chance people cheerfully admit the value of the other prominent mines of Silver Creek, notably the Maud S., Little Fannie, Deep Down, Confidence, Eberle, North Alpine, South Alpine, Consolidated and Champion, all of which are certain to become heavy producers in the near future. It is certain that the Last Chance sale is but the forerunner of several others of equal importance, and Silver Creek is liable to be one of the liveliest mining camps in the west before many months roll by.

NOTES.—Fully 70 men are now at work in the Hanover district, getting out zinc and silver ores. It is stated on good authority that arrangements are now being made looking toward starting up the Santa Rita works at an early date. Rufus Bennett has opened up his Willie mine at Hanover. This is a zinc property. It is said to be the cleanest carbonate zinc ore that has yet been tested.

ZINC.—The Hanover zinc mines are panning out better than at first expected. Twenty-two men are at work in the mines, with Mr. Snow superintending. The company is shipping as rapidly as it can get freighters and cars. The carbonates are being shipped to a Michigan company to be manufactured into paint. The "black jack" is being corded on the ground. This ingredient, otherwise known as zinc of commerce, is used in making zinc vessels and for other purposes. Judges of zinc ores say there are no zinc mines anywhere in the United States which will exceed in richness and quantity the zinc mines of Hanover.

OREGON.

GRAVEL MINES.—Baker City *Democrat*, July 2: The reporter visited the Nelson gravel mines Wednesday in company with D. W. C. Nelson and Paul Kemble. At the mine we were met by Samuel Baisley, manager in charge of the mines. The mine is worked by two giant hydraulics and a force of about 30 miners, assisted by about 2000 inches of water. The Big Aleck mine, operated by the White Star M. Co., Capt. Baxter, manager, was also visited and views taken of the mine and mill, which were in operation with a good showing of ore. The mill plant consists of a Griffin mill and Giroux amalgamator and both are said to work like a charm.

UTAH.

BINGHAM MINES.—*Inter Mountain Mining Review*, July 3: Mining matters are looking very bright at Bingham. Owners of prospects have begun development and there are more prospectors looking over the ground than at any one time for years. The price of lead and silver and the operations of the Niagara Mining and Smelting Co. are doing much toward developing the camp. The Rough and Ready, in the hands of leasers, is sending out some good ore. The Old Telegraph will make its shipments for June about 200 tons. The South Galena is doing its share in regular shipments. The Spanish is being worked by leasers, who are making shipments. This property, including its full group of mines, has this week been sold to Mr. Franklin for the Niagara Co. The Benton leasers are sending out ore in small lots, such as assay 40 per cent lead and 20 ounces silver. Mr. Eyre is getting a fine showing of ore from his Frisco mine. The Stewart mill started up last week, and after a three days' run made a very satisfactory cleanup of gold and then started the mill again. On the Brooklyn there is a reputed vein at the bottom of the shaft carrying eight feet of good ore.

WASHINGTON.

A SMELTER.—Spokane Falls *Review*, July 2: Some time ago it was reported in the *Review* that the Grant Smelter Co. of Denver, Colo., was considering the advisability of locating their smelter in this city. Information was given to the *Review* that shows such report is true, and that the smelter will soon be located in Spokane Falls. It has been known for some time that the Grant Smelter Co. have been looking out for a suitable site in this city, and that such was obtained a few days ago. The action of Mr. Chamberlain of Denver, in purchasing $170,000 worth of land goes to show that the company means business. The Grant smelter is one of the largest in the United States, and it is said that it can be run with less expense nearer the mines than where it is at present located, and it is mainly for this purpose that it will be removed to this city. The shipping of the ore to Denver and other points East not only consumes much time, but also adds considerable expense, owing to the long distance.

List of U. S. Patents for Pacific Coas Inventors.

Reported by Dewey & Co., Pioneer Pate Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 1, 1890.

431,159.—OVEN DOOR—P. Abrahamson, S. F.

431,202.—SWINGING WINDOW—G. D. Crocker, Oakland, Cal.

431,162.—DAMPER FOR STEAM BOILERS—Geo. Cunningham, S. F.

431,259.—RAILWAY SPIKE—S. Emrick, S. F.

431,164.—ELEVATOR—F. Gutzkow, S. F.

431,165.—CAN PRINTING DEVICE—Chas. R. Hay, S. F.

431,476.—CLIP FOR WIRE ROPE WAYS—B. McIntyre, S. F.

431,483.—GANG EDGER—A. E. Roe, S. F.

431,198.—SHINGLE CUTTER—H. O. Strand, Montisano, Wash.

431,176.—FRUIT-GRADER—Geo. W. Thissell, Pleasant Valley, Cal.

431,303.—AUTOMATIC AIR BRAKE—G. B. Williams, Portland, Or.

431,304.—RELEASING ATTACHMENT FOR AIR BRAKE—G. B. Williams, Portland, Or.

The following brief list by telegraph, for July 8, will appear more complete on receipt of mail advices:

California—William Brooks, Oakland, broiler or toaster; Cornelius Butterbaugh, Los Angeles, car track; Frank M. Drelhelbis, Los Angeles, detractable horse-foot pad; Frank Koritick, S. F., combustion tool; Florence E. Monteverde, S. F., pump distributor; Samuel S. Richardson, Happy Camp, damper; Charles T. Stanford, S. F., device for operating elevator hatchway gates; James M. Thorpe, Santa Rosa, adjustable axle nut; Frederick B. West, S. F., cable sheave.

Oregon—George B. Williams, Portland, automatic air-brake.

Washington—William J. Burks, Seattle, headlight to locomotives.

Arizona—Thomas J. Thorp, assignor of one-half to D. J. Brennan, Flagstaff, horse-collar; Thomas J. Thorp, assignor of one-half to D. S. Brennan, Flagstaff, running gear for wagons.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

OVEN-DOOR.—Peter Abrahamson, S. F., No. 431,159. Dated July 1, 1890. This invention relates generally to the class of heating and fire-chambers, and especially to the doors thereof; and it consists of the novel arrangement and construction of the air-passages in the door. The object is to provide for a thorough ventilation of the oven or other chamber whereby its efficiency is greatly increased. Though the invention is applicable to the door of any heating or fire-chamber, it is specially useful for the oven-doors of stoves.

AUTOMATIC DAMPER FOR STEAM BOILERS.—Geo. Cumming, S. F. No. 431,162. Dated July 1, 1890. A chamber or vessel is employed of any suitable shape and size in which mercury is placed. When the pressure of steam in the boiler reaches any desired degree and it is desirable to close the damper and either wholly or partially shut off the draft, the pressure of steam acting upon the liquid in the chamber, through a system of plungers, rods and levers, acting upon the crank arm of the damper shaft, turns the damper so as to close it more or less, according to the hight to which the plunger has been raised. The damper being closed to any desired extent, which is determined by previous experiment. The fire will be correspondingly checked, and as the steam pressure decreases the plunger will descend and the valve will be opened, operating the damper, the operation being entirely automatic.

FRUIT-GRADER.—Geo. W. Thissell, Pleasant Valley, Solano county. No. 431,176. Dated July 1, 1890. This grader has grading-bars, which may be adjusted laterally. Bars or levers are also arranged so as to be turned upward between the inclined bars, and lift and move the fruit and prevent its sticking in the spaces between the grading-bars.

CAN-PRINTING DEVICE.—Chas. R. Hay, S. F. Assignor of one-half to R. H. Marchant. No. 431,165. Dated July 1, 1890. This is a novel device for printing upon the exterior surface of cans, and it is especially applicable to take the place of labels upon cans containing fruit, fish, or other substances, which are usually packed in hermetically sealed cans and afterward labeled by pasting paper labels upon them. By means of this device the inventor is enabled to print in colors upon cans with great rapidity, and the expense and time for putting on paper labels is avoided.

GANG EDGER.—Alpheus E. Roe, S. F., assignor to the Vulcan Iron Works. No. 431,483. Dated July 1, 1890. The points of novelty in this invention lie in the means for shifting the saws, the means for vertically moving the upper feed rolls, the means for holding them in desired position, and the means for driving them.

CLIP FOR WIRE ROPEWAYS.—Bartlett McIntire, S. F., assignor to the Vulcan Iron Works. No. 431,476. Dated July 1, 1890. This invention relates to that class of devices which are intended to be attached to or clamped upon a traveling wire rope, and to have attached to the other end a hanger for supporting a load, said devices being known as clips and forming part of a system of transmission by wire ropeways. The invention relates particularly to that class of these clips which are suitably formed at one end for engagement with the rope or cable, and at the other end for connection with the hanger which supports the load. The main object is to provide a clip which can be used with deeper faced pulleys than those in ordinary use, and also to provide in this connection a simple and effective clamping mechanism.

ELEVATOR.—Frederick Gutzkow, S. F. No. 431,164. Dated July 1, 1890. This is a hydraulic brake and speed regulator which is applicable to devices in which weights are raised and lowered by means of a rope, and especially to house elevators. It consists of a U-shaped tube containing liquid (such as mercury), a piston fitting loosely in one branch of the tube and connected from top and bottom with the top and bottom respectively of the elevator cage by ropes passing over suitably disposed guide-pulleys, and also for regulating passages through which the liquid moves with a retarded motion. The object is to secure the easy descent of the cage to the bottom if the hoisting-rope or machinery should break, and in general, a self-acting regulator of the speed of ascent and descent without the aid of mechanical attachments, levers or clutches.

Mining Share Market.

The mining share market has ruled fairly strong, but choppy. It looks very much as if the ring is selling stocks; yet they may not be, but only working the market so as to induce buying by outsiders who believe that the passage of a silver bill will inflate the market. It is not at all likely that the passage of a silver bill by Congress will help the Comstock mines as much as many think, for all present work appears to be in the direction of the west lode, which is nearly all gold-bearing. But if a silver bill is passed, it will help some of the outside mines. The public should not forget that until the Comstock mines are differently managed, they need not look for any movement in stocks based on merit, for the ring will continue the old game, "boodle for the ring and assessments for the outside public."

In outside stocks, the Tuscaroras are coming to the front, with Del Monte and Belle Isle the favorites. Bodie has been more active, at slight fluctuations. It is claimed that after the assessment is off, Bulwer and Mono will be assessed. It is also stated that some of the Comstock mining companies will levy assessments soon.

A subscriber asks why Overman, with $45,000 in the treasury, does not pay a 25-cent dividend. The stockholders, who have been paying assessments for years, may object to this money being used for manipulating purposes, as was the $200,000 left in the treasury of the Yellow Jacket when that mine went into the hands of the present management in July, 1883. A dividend had been declared at that time, and the new management rescinded it, and absorbed the money in the new style of milling that came into vogue at about that time.

The Virginia City *Chronicle* is authority for the statement that Levy, president, and Bob Keating, superintendent of the Savage mine, and also of the Hale and Norcross, gave a banquet at that place on July 4th, which lasted fully five hours. It is stated that at the banquet champagne flowed like water. Does this foreshadow an assessment by the Savage company? Perhaps both companies may levy assessments.

From the Comstock mines our correspondent writes that Overman is undoubtedly a mine and that well-informed miners are buying the stock. This is not the first time miners bought stocks on merit in a mine. Heretofore they "got left." How it will prove in this case remains to be seen. Our correspondent also reports a decided improvement in Chollar, in Con. Virginia and in Savage. The improvement in Con. Virginia is in the west workings and in Savage in the 1300 north drift. Where Chollar's improvement is he did not write. In Hale and Norcross on the 1250 level running west, they have cut the apex of an ore body. In Best and Belcher they are nearing the ore on the 1200-foot level near the Con. Virginia line. In Sierra Nevada and Mexican they are in interesting ground. Good reports ought soon to come to hand from the workings in Potosi. In old Belcher they are stoping out ore. In the other Gold Hill mines very interesting and encouraging work is being done.

News from the outside mines is still favorable from the Tuscaroras and Quijotoas.

We are officially informed that they are putting the pumps into place in Crown Point. It is expected that they will start up on July 20th, or at farthest by August 1st.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

KEYSTONE AUTOMATIC LIFE-SAVING CAR-COUPLING CO. OF CALIFORNIA. July 1. Object, to manufacture, sell and deal in life-saving car couplings, and particularly to manufacture and sell and deal in a certain car coupling invented and patented by Chas. A. McDougall of Alameda. Capital stock, $10,000,000. Directors—Lyman I. Mowry, Jas. S. Flood, J. W. Brown, E. Rocbart, J. C. Zellerbach, Wm. E. Bates and Chas. A. McDougall.

PACIFIC INVESTMENT CO., July 2. Capital stock, $1,000,000. Directors—F. F. Upton, T. H. Macdonald, C. B. Sessions, G. M. Crane, Joseph E. Green, G. W. Swain, A. M. Lusk, C. H. Reuter and W. I. Crossett of San Francisco.

ZENO MAUVAIS MUSIC CO., July 2. Capital stock, $80,000. Directors—Mae Mauvais, Nina Mauvais, R. L. Eames, J. G. Eames and Ella J. Stewart.

CENTRAL CANAL CO., July 2. Object, to improve irrigation facilities in Kern and Tulare counties. Capital stock, $3,000,000. Directors—Robt. McMurray, H. F. Culber, Geo. Easton, Geo. H. Maxwell and Geo. R. Wells.

TORPEDO STATION.—The Government engineers are building a torpedo station on Goat Island in San Francisco bay. The building will be of concrete, and cost about $20,000. All the torpedoes and other material used in the torpedo service on this coast, will be stored there.

MECHANICAL PROGRESS.

American Inventions Abroad.

The popularity of American machinery and other useful devices seems assured wherever it is put to the test—especially in comparison with those of European product. This assertion is fully verified by the unquestionable fact that the export of American machinery is rapidly increasing. The demand from abroad for

American Textile Machinery,

According to London *Engineering*, has of late been more active than ever before, and is undoubtedly to be attributed to the numerous patented improvements that have been and are constantly being added to American machines for cotton and woolen manufacturing, and which are now bringing them prominently to the front. These devices, the result of American ingenuity and invention, have been patented both in America and foreign countries, thus fully protecting the rights of inventors and manufacturers, and foreigners are not slow to recognize their merits. In the case of

The American Loom

This is especially true, for it is generally thought that for speed and good workmanship combined it is superior to all its foreign rivals. As a result it is being gradually introduced in many English factories, where practical test has clearly demonstrated its uses. In the United States the ring-spinning frames are largely taking the place of mules in many of the mills, and these are now beginning to force themselves upon the attention of foreign manufacturers, who, though slow to adopt new methods, and conservative in the extreme, cannot afford to neglect any improvements, from whatever source they may come, which will give them any advantage, however slight, over their competitors. The same is true with regard to many other machines used in the textile industry, in which the inventive genius of the New World has suggested valuable improvements over existing methods, and which are certain to come to the front in foreign countries as soon as their value is appreciated. During the past 12 months the value of cotton and woolen machinery exported from Boston alone has amounted to nearly $325,000, which shows an increase of almost $100,000 in comparison with the year previous. Our exports of machinery are far from being confined to the English markets. In addition to many other things,

The American Steam Fire Engine

Is to be introduced into Berlin, Germany. This is due to the recent visit of the officials of that city to America, in which a careful study was made of our fire apparatus. Such incidents as these show the grand importance of public exhibitions, mechanical and otherwise, which bring consumers and producers together. Other European countries are also looking more carefully than heretofore into the value of American machinery of different classes. The improved tools which are being introduced into our machine shops, the more deft manner of handling them and their more general use in supplanting hand labor than is practiced in Europe is enabling us to more than offset the great difference in the cost of labor there and here. This is especially noticeable in the

Comparative Cost of Our Locomotives.

When Bret Harte was American Consul in Glasgow one of his reports to our government brought this fact out very decidedly. His opinion then expressed is fully confirmed from official reports: A British locomotive-building company, noted for the fine equipment of tools used, and the advanced system of production followed, built 200 locomotives in 1889, while employing on an avarage 2500 men; a well-known American firm in the same time built 300 locomotives, while employing only 1400 workmen. Allowing 300 days for a year's work, the American firm puts the labor of one man for 1400 days on each engine finished. At the same rate the British builder puts the labor of one man for 3750 days on each locomotive sent out of the shop. The weight and power of the American locomotives greatly exceeded these built in the British shop. This is no hearsay matter. It was a comparison made by the chief executive officers of the two works referred to. The British firm follows largely the American practice of production by piecework, and the process of manufacture appeared to be very systematically carried on. There is, of course, a cause for the great difference in rapidity of turning out the finished machine. What that is may be nearly surmised.

American Machinery for Japan.

A New York firm has just turned out at Pittsburg and shipped to Hiogo, Japan, a complete plant for the manufacture of the camphor of commerce from the plants and wood fiber in which it is found in that country. The completion of the plant and its shipment may work a revolution in the manufacture of the drug. The plant, which is composed of stills, engines, boilers and other pieces, weighs 55 tons, and when shipped occupied two cars. Dr. A. G. Boyer, a prominent chemist, has been engaged for several years by the New York firm in trying to devise improved methods for the distillation of crude camphor into the articles of commerce, with a view of erecting a plant in Japan. He spent two months in Pittsburg, personally superintending the construction of the plant. He recently left this city (San Francisco) for Hiogo, where he will remain as chemical expert for three years.

What An American Saw in the Orient.

The New York *Congregationalist* recently published a very interesting letter from a correspondent who detailed what he saw while journeying through Central and Eastern Asia. We make a few extracts as follows: I saw advertisements for the sale of the Waterbury watch filling whole columns in newspapers and large spaces on the outer walls of buildings in all the great cities of India. I heard the hum of the American sewing machine in the byways and broad streets of Bombay and Calcutta and Rangoon. I saw American lamps for burning American petroleum hawked about the streets on wheelbarrows for sale in Yokohama and Tokio and Shanghai. I heard the clatter of the American typewriter in Chefu and Tientsin and Swatow and Amoy. I heard American dentistry praised as the best in the world, and I traveled with an American dentist who was on his way to practice his profession in the city of Peking. I afterward received his printed circular announcing his arrival in the great imperial city, and his readiness to extract the molars of mandarins or fill the cavities of Confucianists in the most approved style of American art.

I saw American tram cars running in the streets of Tokio, and the American windmill pumping water on the Bluffs of Yokohama. I was glad when I heard the click of Connecticut clocks keeping good time for Orientals who are always behind. California canned fruits and Oregon salmon and Boston baked beans in hotels all over the East, made me feel that home was not so very far away, and that the time was fast coming when one might compass the globe and find himself at home and among his own people, and hearing the familiar sounds of his mother tongue all the way. And the fact that America is so often represented in the East by the homely articles of practical and every-day use did not make me wish that my country had more works of fine art, or more ruins and traditions of ancient times.

STRUCTURAL IRON IN NEW ENGLAND.—In the past two or three years, the structural iron business in New England has undergone several changes. Formerly the bulk of the trade was in steam railroad work, but as New England has had sufficient track for the past two years, the call for this class of iron fell off, but was superseded by a heavy and improving demand in structural iron for buildings, in which the trade increased until last year, when the amount of business transacted in that line was unprecedented. A number of small contracts for thousands of tons were placed, and dealers were looking forward to a very good year in 1890. But in this they have been disappointed. The strike early in May dealt the business a blow which it will not be able to recover from this season. As it is, there is a fair business doing in iron for building purposes. Several large cities in New England were to be adorned with massive new buildings, the most important of which were Worcester, Springfield, Lynn and Lowell. Some very large contracts were placed this year. At present there are several large ones outstanding, in consequence of the labor troubles. The last two years in the structural iron trade have been rather peculiar and interesting. The decline of the steam-railway business was superseded by the demand for beams, girders, cast iron and other iron material consumed in the construction of large buildings, and in turn the decline in that business this year has given place to a substitute in the electric and street railway trade.

POSSIBILITIES OF INVENTION. — "When I first heard of a machine for driving spokes in wheels," says a writer in the *Age of Steel*, "my first idea was that such a machine could not be very profitable to employ. It takes but few blows to set a spoke 'solid home' by hand, and the machine could not possess the intelligence to know when the spoke was just home. I had known a most reputable firm of carriage makers to boast that their reputation was largely due to the fact that every spoke in their wheels had been driven by the senior member. When I came to see the machine driving 12 spokes in each wheel as well as they could be driven by hand, sawing them all off to equal lengths, and turning down the ends to fit the holes in the fellies, and doing all this to 300 wheels a day, my opinion of the value of that special machine underwent a radical change."

A NON EXPLOSIVE BOILER.—The members of the Breslau Engineers' Association inspected a non-explosive tubular boiler which had been constructed by Messrs. Stanislaus Lautner & Co. of Breslau. The danger of explosion is averted by means of automatic apertures, which slowly act when the steam exceeds a certain pressure, the water thereby being allowed to escape until the normal pressure is regained. The rapid water circulation in the vertically arranged tubes prevents incrustation and the deposit of mud.—*Kuhlow's German Trade Review.*

SUGAR IN STEAM BOILERS.—An engine driver at Bangalore, India, is said to have discovered that the slightest mixture of jaggery with the water used in boilers prevents incrustation. A pound of jaggery to 1000 gallons of water will suffice. Jaggery is a coarse kind of sugar made in the East Indies from the juice of the cocoanut palm tree.

SCIENTIFIC PROGRESS.

Recent Discoveries in Magnetism.

Dr. Hopkinson, President of the London Institution of Electrical Engineers, in a recent address before that body, alluded to some lately discovered and very curious facts in regard to magnetism which have thus far puzzled the scientists. The facts were referred to substantially as follows:

Why do iron, nickel and cobalt possess a property (strong magnetic susceptibility) which we find nowhere else in nature? that, so far as he knew, nothing that had ever been proposed even attempts to answer it. It is really one of the marvels of nature that there should be three bodies differing so enormously from all others in a matter of such great importance as magnetic susceptibility.

While it would interest only the physicist to follow in detail the developments in magnetic theory and knowledge, some very striking facts have been lately brought forward which should interest all, though at first they seem to obscure rather than to lighten the question above stated.

It is now pretty widely known that iron suddenly ceases to be magnetic when heated to the critical point of its "recalescence" or "after glow," and that if alloyed with some 12 per cent of manganese, as in manganese steel, it becomes almost completely non-magnetic. These facts show that iron is not necessarily magnetic under all conditions, for a mixture with a small quantity of another metal, and even mere change of temperature render it non-magnetic. Stranger still, some observers report that iron again becomes magnetic when the temperature reaches whiteness, but this lacks confirmation.

The behavior of nickel-steel is very remarkable. As usually received from the maker, nickel-steel with 25 per cent of nickel is non-magnetic, and yet it is a mixture of two magnetic metals, iron and nickel. If, now, we cool this nickel-steel to 20 degrees C., it becomes very decidedly magnetic, and remains so when it again returns to the normal temperature. If, finally, we heat it, it remains magnetic till it reaches its critical temperature of 580 degrees C, when it again becomes non-magnetic, and remains so until again cooled to 20 degrees C. In short, this nickel-steel may at the common temperature be either permanently magnetic or permanently non-magnetic as we please. We can at will make it permanently non-magnetic by heating it momentarily to 580 degrees C., and again cooling it, or permanently magnetic by cooling it temporarily to 20 degrees C.

Nickel steel has been recommended for shipbuilding because non magnetic; but if the nickel-steel ship is to become magnetic suddenly and without a word of warning on cooling to 20 degrees C., sending its compass spinning, its sphere of usefulness would be limited, for, though this temperature is not reached during common ocean trips, yet vessels in port in New York, Boston or Halifax, on the Great Lakes and elsewhere, are occasionally exposed to it. Reheating the vessel, to unmagnatize it, seems at first to present technical difficulties. Now, not only does cooling make 25 per cent nickel-steel magnetic, but it changes it from soft to hard.

Pull a bar of non-magnetic 25 per cent nickel-steel apart tensilely, and, presto, its broken fragments are magnetic!

This, be it understood, is the behavior of 25 per cent nickel-steel. It does not at all follow that, with other proportions of nickel, the same strange conduct will be found. Thus, with five per cent. of nickel, steel becomes non-magnetic when heated to about 800 degrees C. Like 25 per cent nickel-steel, it remains non-magnetic when cooled somewhat below this temperature, regaining its magnetism at a decidely lower temperature, but this lower temperature at which it again becomes magnetic, instead of being below zero, is somewhere about 650 degrees C. Again, it has become pretty well known that tungsten, itself unmagnetic, greatly increases the magnetism of steel; and now it turns out that it plays the same part with nickel, three per cent of tungsten making nickel more strongly magnetic than the steel of which magnets were formerly made. While tungsten raises the magnetic induction of steel from 700 to 5000 it raises that of nickel from 120 to 1032.

AN AIR BRUSH, as it is quite appropriately named, is the name of a device, which has recently been invented. It is used to throw pigments upon paper, very much as sand is thrown in the sand blast. The pigments are forced upon the paper or canvas through a flexible tube, by air which is condensed in a receiver by the aid of the foot and an air pump. The flow of the pigment is regulated by a valve, operated by the thumb, the tube being held and guided by the hand. It can be made to represent a fine line as in writing, or broadened out to any reasonable width of shading. It is claimed that one skilled in its use can produce a very excellent artistic effect, even in a portrait—one color only being used upon the background. If desired, the work can be finished up with the ordinary brush or pencil, employing the air brush only to do the drudgery. The effects produced by this instrument, in the hands of an expert, in a few minutes, can only be equalled by a band of expert toil by any other known process. In originality of conception, and in beauty and novelty of execution, it may be classed among the most remarkable of inventions, so it is said. The air brush is intended specially for working with India ink and water colors, and for applying lithographers' ink to the stone. Any color, or combination of colors, may be employed, presuming only that the pigments are liquid enough to flow readily. It is reported to work upon vellum and cloth without causing it to wrinkle, and to yield fine results on satin, tapestry, holting cloth, China silk and velvet. Its most obvious uses are as an aid to the artist in crayon and pastel work, especially in portraiture; in water-color work; to the photographer for finishing prints and re-touching negatives; to the lithographer as a labor-saver in placing the work on the stone, and in architectural, mechanical and engineering drawing, etc. This remarkable apparatus is manufactured by the Air Brush Manuf'g Co., of Rockford, Ill.

THE BIG IOWA METEOR.—On the evening of the 23 of May, as it is reported, the farmers living three or four miles southeast of Norway, Iowa, saw in the heavens an elongated, pear-shaped mass of dazzling whiteness. It seemed "as big as a mountain" to their excited vision, but intelligent observers agree that it was probably about 2000 feet long and 400 feet in diameter, with a tail of twice that length and much narrower across than the solid body. While the farmers gazed and wondered, it suddenly burst before their eyes. On going to the spot the next morning, where it appeared to have fallen, they found a space some three miles in length and a mile in width where great numbers of fragments had fallen and buried themselves in the earth. Search for fragments was immediately commenced, which resulted in finding a great number, the largest of which is said to have weighed 66 pounds, and was sold for $132. The story seems to bear evidence of truth.

ATMOSPHERIC ELECTRICITY — In the course of four years of experimenting, M. Albert Nodon has established the fact that when the sun's rays fall upon an insulated conductor, metal or carbon, they communicate thereto a positive electric charge, which increases with the intensity of radiations and decreases with the hygrometric state of air. At Paris the electrification is greatest at about 1 P M. when the air is clear and dry; but it disappears on the passage of clouds near the sun. The experiments indicate the source, or at least, one source, of atmospheric electricity, as it may be assumed that the surface of the earth becomes positively electrified, while the heated air rises with a negative charge which it imparts to the clouds. This hypothesis would explain many thunderstorm phenomena, including the frequency of such storms over forests, rivers, lakes etc., where the cooler air causes the electrified clouds to fall toward the earth until a discharge takes place.

COLD AIR ON TAP.—The Philadelphia *Record* is authority for the statement that capitalists in that city are about preparing to serve cold air about the city as gas or water is served. Chilled air is even now being furnished from a certain manufactory, to customers within a few blocks, and it is intended to nurse this little nucleus until a large and profitable system is hatched. It is proposed by laying the pipes deep and coating them with a non conducting substance, to force cold air from the central factory into market-houses, abattoirs, stores and even private residences.

FOGS AND ORCHIDS.—Fogs are highly prejudicial to orchids and tomatoes, according to a report presented to the Royal Horticultural Society by Dr. Oliver and Prof. Scott. This has been proved experimentally, and the society has determined to analyze the gloomy mists to find out the reason. The fact is that, besides other damage, they choke the "stomata," the breathing apparatus of plants, and years ago it was proved at the Royal Botanic Gardens that every season added to the list of fresh plants that could not live in London.

HOW POWDER SCORES GUN BORES. — The scoring of the bores of modern cannon by the new powders in use is claimed to be due to the fact that upon ignition all of the powder is not turned to gas, some of it remaining in a fluid state. It is this latter which does the scoring, by being thrown with such force against the metal of the gun that the resulting action is very similar to that of a sand blast for cutting glass.

DIFFERENCE IN TIDE LEVELS NEAR NEW YORK.—Observations of the tides of the Harlem at Forbam Landing with those of the Hudson at the mouth of Spuyten Duyvil Creek show that the level of mean high water in the Hudson is nearly a foot lower than in the Harlem, and that the mean rise and fall of the tide in the Hudson are a little more than two feet less than in the Harlem.

TWENTY ONE OBSERVATORIES are now engaged in the international undertaking of photographing the entire heavens. Each observatory will have to take about 700 photographs in the zone assigned to it, and it is hoped to finish the work in three or four years.

A NEW CALCULATING MACHINE.—A French mechanic by the name of Bollie has invented a calculating machine which adds, multiplies and divides with astonishing rapidity by the simple turning of a wheel.

GOOD HEALTH.

OLD AND YOUNG SHOULD NOT SLEEP TOGETHER.—A prominent medical writer says that no intelligent person who loves his children will allow them to sleep with persons greatly older than themselves. The nervous vitality of a child should not be absorbed by any diseased or aged relative or friend. Children, compared with adults, are electrically in a positive condition. The rapid changes which are going on in their little bodies abundantly generate and as extensively work up vital nervo-electric fluids. But when, by contact for long nights with elder and negative persons, the vitalizing electricity of their tender organizations is absorbed, they soon pine, grow pale, languid and dull, while their bed companions feel a correspondling invigoration. It is undeniable that healthful influences are lost, and to a fatal extent sometimes by this ill-advised custom. A woman was prostrated with inonrable consumption. Her infant occupied the same bed with her almost constantly day and night. The mother lingered for months on the verge of the grave, her demise being honrly expected. Still she lingered on, daily disproving the predictions of her medical attendants. The child, meanwhile, pined without any apparent disease. Its once fat little cheeks fell away with singular rapidity till every bone in its face was visible. Finally it had imparted to the mother its last spark of vitality and simultaneously both died.

MISTAKES.—It is a mistake to labor when you are not in a fit condition to do so; to think that the more a person eats the healthier and stronger he will become; to go to bed at midnight and rise at daybreak, and imagine that every hour taken from sleep is an hour gained; to imagine that, if a little work or exercise is good, a violent or prolonged exercise is better; to conclude that the smallest room in the house is large enough to sleep in; to eat as if you had only a minute to finish the meal in, or to eat without an appetite, or to continne after it has been satisfied, merely to please the taste; to believe that children can do as much work as grown people, and that the more hours they study the more they learn; to imagine that whatever remedy causes one to feel immediately better (as alcoholic stimulants) is good for the system, without regard to the after effects; to take off proper clothing out of season because you have become heated; to sleep exposed to a direct draft; to think any nostrum or patent medicine is a specific for all diseases.

SURGERY OF THE LUNGS.—In recent months surgeons have given astonishing proofs of the possibility of saving life and restoring health, in many cases, by removing portions of such vital organs as the brain and the liver. Prof. Tillmanns, of Leipsic, has found that surgical treatment may be extended even to the lungs, and to the arrest of consumption. In a case of tuberculosis of the left lung, an opening was made and the diseased part of the lung exposed, when that portion shriveled and was carefully removed. The patient recovered, and is now able to work. Prof. Tillmanns believes that this may prove a desirable treatment when the disease is localized, and states that two operations would doubtless be necessary—one to expose the affected part of the lung and bring about atrophy and shriveling, and a second to remove the parts after being functionally disabled.

THE OFFICE OF IRON IN THE BLOOD.—Iron exists in the blood in the red corpuscles, and gives them color and the power of absorbing gases. The fact that peroxide of iron is one of the readiest absorbents of gases, and parts with them as readily on exposure in thin layers to the air, so that it can be used over and over again for that work, gives a clew to its special function in the red corpuscles of the blood. It enables them readily to absorb oxygen as they pass along the minute blood-vessels of the lungs and to carry it to all parts of the body, where they part with it as it is demanded. It is supposed, also, to take up carbonic acid in exchange for the oxygen it yields up, and to convey to the lungs that portion of this substance which is expired.

COLORED SPECTACLES.—Dr. Konigstein, while giving directions in his class of the uses and prescribing of spectacles, said that green glass as a protection against strong rays was worse than useless, and did more harm to a sensitive eye than good, as they allowed the yellow rays to be transmitted and unnecessarily irritate the eye. As a protection against strong rays, the blue or smoked glasses were the only protection.

SOMETHING NEW IN SKIN-GRAFTING.—A schoolboy recently scalded his leg badly from knee to toe. As there were no signs of healing, the attending surgeon chloroformed a greyhound puppy to death, shaved its body, skinned it, and grafted the skin on the boy's leg. The healing was rapid, and the color of the grafted skin was uniform and very similar to that of the normal skin.

FOR TOOTHACHE.—A Russian practitioner recommends the use of hyoscyamus seeds for toothache. His plan is to burn the seeds, and to convey the smoke through a little paper tube to the hole in the tooth. He declares that in nearly all cases one application, or at most two, will suffice to cure the toothache.—*Lancet.*

THE BUILDER.

Causes of Decay in Stone Buildings.

Prof. Tetmajer of Zurich, one of the greatest living authorities on such subjects, made recently an investigation into the causes of decay of stone in buildings. According to recent authorities, the freezing of water in the pores of stone is the principal cause of disintegration. Contrary to the common idea, the most porous stones are, if properly used, not necessarily most subject to disintegration. If the water falling on the stone has a chance to escape freely, frost will not injure it, but if the movement of the water in the pores is checked, so that it accumulates anywhere, the freezing of this accumulation will gradually destroy even a strong stone. Proof of this may be found in nearly all buildings faced with sandstone or limestone. If the base or water table, or even a belt at any height is of harder stone, the freestone just above it will be found to disintegrate after a few years, owing to the checking of the downward movement of the water in the pores. So, on the underside of a projecting molding, or balcony, where the water accumulates by gravitation, but is prevented by capillary attraction from dropping off, flakes of stone will soon be observed to separate and fall; and soft stone near the ground, where moisture drawn up from the earth by capillary attraction with the double effect of the rain, and the spattering of rain water from the ground, keep it particularly moist, soon perishes. The decay of stone shows itself in two ways. With a stratified stone the frost dislodges flakes and plates, by working in the natural seams, but with a massive, homogeneous stone, the effect of freezing is to dissever the particles of sand, or the crystals of carbonate of lime, so that, although the stone may for a long time hold together nearly in its original shape, the rubbing of the hand will dislodge a shower of sand, and the profiles and arrises insensibly lose their sharpness.—*American Architect.*

PANELLED IRON CEILINGS.—Patent panelled iron ceilings have been before the public for the past eight or ten years, and now there are thousands in use, scattered all over the Union. In stores, banking offices and hotels, while their superior acoustic properties have brought them into extensive demand for churches, halls and opera houses. Their low cost and cleanliness introduce them into schools and asylums. And now the increasing demand for something to take the place of plaster for residence ceilings, something that would gratify the artistic taste of our most cultivated housewives, and still be permanent and enduring, and thus save them the constant annoyance and expense of replastering and repapering; something that could be applied over the old broken plastered ceilings without being compelled to take down and remove the dirt and dust-covering stuff, has prompted the makers to bring out beautiful designs of embossed metal plates. These embossed plates are adapted to side walls as well as ceilings, working up beautifully into wainscoting, frieze and field. As all figures and designs are in relief, really very little brush decoration is needed. They are, however, susceptible of any desired degree of ornamental decoration from simple, quiet tinting to the most elaborate and ornate display of coloring, gilding and bronzing, giving abundant scope for display of taste and talent to the most gifted decorative artists.

PLUMBING IN SMALL BUILDINGS.—Many people are prejudiced against placing a water-closet in the house, presuming that foul odors and danger to health will follow shortly after its introduction. A careful estimate shows that in an average house, built ten feet back from the street line, two stories high, the cost of putting in a soil pipe and house sewer will be about $60; a kitchen sink with waste, trap and vent, $15; water closet, tank, vent pipes, etc., $40; carpenter work, joiner work, plastering, painting, etc., $10; total, $125. A bath-tub and wash-bowl, although desirable, are not necessary; they can be added at an additional cost of about $40. In any building worth $1000 an expenditure of $125 for putting in plumbing fixtures is not extravagant when we consider the danger to health avoided in winter, by the use of water-closets within a building, instead of outside privies, and in summer the improved sanitary condition of the premises, especially of the back yard and the rooms overlooking it. The floor space required in a building for a water-closet compartment need not exceed three feet by four feet, but that compartment should be well lighted and ventilated.—*Ex.*

A WATER TELEPHONE has been recently patented in England, an apparatus employed for the collection of sounds transmitted though water, particularly between ships, but some difficulty is experienced in properly recording the sounds on account of the instrument being affected by other causes, such as the movement of the ship. This defect has now been remedied by constructing the apparatus so that any pressure caused by the increased density of the water has no effect upon it.

A USEFUL ATTRIBUTE OF PAPER not generally known is for preserving ice in a pitcher of water. Fill the pitcher with ice and water, and set it on the center of a piece of paper; then gather the paper up together at the top and place the ends tightly together, placing a strong rubber band around the coil to hold it close, so as to exclude the air. A pitcher of ice-water treated in this manner has been known to stand over night with scarcely a perceptible melting of the ice.

THE HOUSE ARCHITECTURE of to-day is, in too many instances, like too many other things of the time—cheap and showy. The dwelling the persuasive house agents seek to palm off on the innocent householder of small means has a tower, bay windows, gingerbread chimneys and curlyone walls, but no cellar. Just the most important part, next to a good kitchen, the plain, convenient, old-fashioned cellar, with solid stone walls, keeping the house cool in summer and warm in winter, is left off. It costs too much. So, when you buy a house, be sure that it has a tower, a galvanized, painted sheet-iron affair, like a tin pan turned bottom upward. Oh, yes! Let the cellar go, but do not omit the tower or the cast-iron monkeys around the railing.

A DERRICK used by a shipping company at Hamburg can pick up a ten-wheeled locomotive with perfect ease.

USEFUL INFORMATION.

How to Trim a Lamp Wick.

If a lamp wick is trimmed by shears, cutting it across just below the charred part, one end will almost certainly be left higher than the other. In such a case the wick cannot be turned up enough to give much light, because the higher end of it will begin to smoke before the remainder of it gives out one-quarter of the light which it should. If the wick is cut straight across, the flame will be irregular. This kind of a flame is caused by inequalities of combustion at the sides and ends of the wick. To cut a wick exactly square across is almost impossible, even if it were best; and a flame with a low center and a tall, flaring, smoky horn on each end is a bad flame. It is bad for the lamp chimneys and for the eyes. No lamp which has such a flame is properly trimmed. If one tries to avoid the horned flame by rounding off the ends of the wick, an imperfect flame will result. This flame may not crack chimneys, but it will give out but little light. It shows an honest attempt to trim the lamp properly, but an unsuccessful one. To secure a good flame, the lamp-trimmer should be instructed to turn the wick up until about one-eighth of an inch projects above the brass sheath. Next, let him take off the charred portion. Let this be done with the forefinger and thumb.

Cutting with shears, besides the mischiefs already set forth, will take off more than is necessary. Rubbing off the charred portion with the back of a knife, or a blunt edge of any kind, will generally leave fibers, which will cause an uneven light. With the finger and thumb just enough can be taken off, and taken off smoothly. All that will not easily break off is good, sound wick, no matter how black it may be. After pinching off the burned portion of the wick, take just as little off the corners of it as a sharp pair of shears will take hold of and cut. There is always more danger that too much will be taken off than too little. But if just the right quantity is removed, and the cuts on the two corners are made at the same angle, the lamps will give out a broad, white flame. To trim a new wick, turn the wick down until the loose and unraveled end projects from the brass sheath, and light it before the oil fills it. It will quickly burn down to the sheath, leaving a straight edge, and can then be trimmed as directed above. The end can as well be burned down to the sheath before the wick is put into the oil.

MUSTARD OIL AS A LUBRICANT.—Mustard oil has of late been given some attention as a lubricant—in fact it is reported to have been successfully used for some time in Germany for lubricating purposes, being manufactured at Ilversgehofen, near Erfurt. It is said not to be susceptible to cold until a temperature of from nine to ten degrees centigrade below zero is reached, and besides does not easily become rancid or form fatty acids which would attack metal. Its lubricating value, moreover, according to Professor G. Herrman, of Aix-la-Chapelle, is of a relatively high order. No particulars have been yet given as to the cost of the new lubricant, its specific gravity, etc.

HEMP SILK.—Mr. Nayemura Sakuahuro, a druggist of Hikone, in Omi, Japan, has succeeded in converting wild hemp (yaohyo) into a substance possessing all the essential qualities of silk. Nothing is said about the process, but it is asserted that trial of the thread has been made at the first silk-weaving establishment in Kioto and other factories, with excellent results in every case. The plant in question grows on moors and hillsides. Its fiber is said to be strong and glossy, in no wise inferior to silk when properly prepared. Cultivation on an extended scale would present no difficulties.

A CUP OF COFFEE.—Coffee is far more delicious when made with egg than it is without. One egg to a teacupful of ground coffee is about the right proportion for a rich extract, but less than this can be easily used by adding a teacupful of cold water to a well-beaten egg, and using enough of this mixture to thoroughly wet the ground coffee. Beat an egg thoroughly, add two tablespoonfuls of cold milk; pour this mixture into a pint of boiling milk, let scald but not boil. Try this when you have no cream for breakfast coffee.

ENGINEERING NOTES.

Connecting the Mississippi with the Lakes.

The work of connecting the Mississippi with the Great Lakes may now be considered as an enterprise fully determined upon.

The law passed at the last session of the Illinois Legislature, providing for an immense system of drainage for the benefit of Chicago and its environs, and preparing for the building of a great waterway between Lake Michigan and the Mississippi river, has been declared constitutional by the Supreme Court of that State, and will soon begin to take a practical form.

The main plan involves a diversion of the sewage of the city from the Chicago river and Lake Michigan, sending it through the Illinois and Michigan canal, or the Des Plaines, into the Illinois river, with a sufficient flow of water to render it harmless to the health of the districts through which it is to pass. The State authorities, to insure the best results in this and other respects, decided that the sewage outlet must be made also a navigable waterway.

The aggregate cost of the work will be somewhere in the neighborhood of $20,000,000, perhaps more. An annual taxation of some $2,000,000 will be assessed upon the property, to be directly benefited by the improvement. But as it is one of the most wealthy districts in all the Great West, and the benefit to be derived a very important one, no objection will be made to the assessments.

The work is really one of national importance, and there is really no good reason why the National Government should not give material assistance to the enterprise, especially as it will afford a waterway directly into the lakes for the admission thereto of warships, and open up a new commercial waterway for a large region of the Upper Mississippi valley.

The English Channel Tunnel Craze.

The engineers of Europe are doing their best to devise some engineering scheme to connect England with the continent, so as to do away with the fearful craze that, somehow or other, either tunnel or bridge will open up a highway over or through which the armies of Europe may at some unexpected moment pounce upon the now tight little isle, and make it an annex to France or Belgium. The latest plan is that of a French engineer, who proposes to accomplish the work by a union of bridges and tunnel. His scheme borders on the audacious. He proposes to build a pier or viaduct half a mile in length on each side of the channel. These piers are to be connected by a tunnel with continuous rails, the descent from the bridge to the tunnel being effected in a tube by any system serving for steep inclines. The distances from the extremity of the pier to the mouth of the tunnel is to be only 80 or 100 yards. The undertaking is estimated not to cost more than a tunnel. The works will not obstruct the navigation, nor create any International difficulty, for the pillars of the piers are to be 500 yards apart, with a hight of 150 feet. The scheme, M. Varilla says, can be carried out in six years. It meets strategetic difficulties, for the tunnel terminates out at sea on both sides, and if the connection between pier and tunnel were interrupted, the train cannot ascend or descend, for, when the tube is once destroyed, the tunnel is submerged.

All sorts of reasons have been hunted up from time to time to bring the English public to the point of thinking that there must be some way of accomplishing the work without endangering the safety of English soil. There are now three ways proposed from which choice may be made. We are waiting to see what our English cousins will say to the last. Ever since the first Napoleon threatened a war of invasion, the English have looked with suspicion upon any attempt to facilitate communication between the British Isle and the mainland. The commerce of the world requires that some plan should be accepted, and this last seems to be practicable and less expensive than either a tunnel or bridge for the whole distance.

MINING ENGINEERS.—The fifty-seventh meeting of the American Institute of Mining Engineers will be held in the City of New York, beginning Monday evening, September 29, 1890, and continuing on Tuesday and Wednesday of that week. The members of the Iron & Steel Institute of Great Britain, and many other foreigners interested in engineering enterprises generally, will also attend the meeting.

A FLOATING TUNNEL.—James Maxton, a civil engineer, proposes to build a floating railroad tunnel, to be anchored about 60 feet below the surface across the North channel, between Ireland and Scotland, a distance of 20 miles, and between Patrick and Donaghade. The estimated cost is £5,520,000.

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Passing Events.

The Silver bill reported to the Senate by the "Compromise Committee" is attracting the attention of the silver men and is given elsewhere in this number of the PRESS. A careful study of the situation forces the conviction that the recently expressed views of Hon. Francis G. Newlands on the silver question will be the rallying cry of the himetallists throughout the United States, and that the friends of silver will support at the coming Congressional elections only such as are in favor of placing silver on the same footing as gold.

The molders' strike still continues with little change. A few men desert the foundrymen, but more come from the East to take their places. The foundrymen say they can fill all orders with their present force of molders.

Elsewhere in the PRESS is a brief description of the Dalmatia mill—the first quartz mill in California to be run by electricity. The plant is three miles distant from the point where the power is generated.

THE Marysville *Democrat* says everything is booming at Smartsville now under the influence of the drift mining operations, there being 84 men employed in the Blue Point, 60 in the Wheaton and 40 in the Mooney Flat, making a total of 184, all of whom are paid good wages.

A MARBLE MONUMENT to Padre Junipero Serra, the founder of the California Missions, is to be erected on the beach at Monterey, through the liberality of Mrs. Leland Stanford.

THERE are in Utah 11 smeltere, 6 large stamp-mills and 10 sampling works.

The Silver Compromise Bill.

On last Monday the Conference Committee on the silver bills reported to the Senate a compromise measure. The substitute provides that the Secretary of the Treasury shall purchase from time to time silver bullion to the aggregate amount of 4,500,000 ounces, or so much thereof as may be offered in each month at the market price thereof, not exceeding $1 for 371 25 100 grains of pure silver.

Treasury notes issued in payment will be redeemable in coin, and will be legal tender in payment of all debts, public and private, except where otherwise expressly stipulated in contract, and will be receivable for customs, taxes and all public dues.

Upon demand of the holder of the Treasury notes the Secretary shall, under such regulations as he may prescribe, redeem such notes in gold or silver coin, at his discretion, it being the established policy of the United States to maintain the two metals on a parity with each other upon the present legal ratio or such ratios as may be provided by law. The Secretary of the Treasury shall each month coin 2 000,000 ounces of the silver bullion purchased into standard silver dollars until the first day of July, 1891, and after that time he shall coin out of the silver bullion purchased as much as may be necessary to provide for the redemption of the Treasury notes.

The present law is repealed. The last section provides for covering into the Treasury the fund held for the redemption of the National bank circulation.

The bill is far from satisfactory to himetalists, but it is perhaps the best that can be obtained at this session of Congress. Had provision been made for free coinage after the price of silver advanced to par, then no serious objection could be urged against the bill, but as it is, silver is still treated as a commodity and as such it will be subjected to speculative influences. This, of course, is what Wall Street and the "gold bugs" in general at the East wish, for they can get higher rates of interest, besides speculate to a much better advantage, but to the country at large it is ruinous, for there are too many industries whose prosperity is dependent upon silver—the higher it advances in price, the greater the benefit that will be secured.

Gold Mining in Nicaragua.

A new mining law has recently been adopted by the Government of Nicaragua, in some respects modifying the *codiga de mineria*, under the provisions of which all the mining operations of the Republic have been conducted. A noticeable feature of these laws will be found embraced in Article 2 and which requires a foreign resident who wishes to enter or denounce mining lands in the new district of Prinzapolka on the Mosquito Reservation, to renounce in his petition his foreign status and all right to appeal to his home government in case of damages to his person or property.

The reason assigned by the Government for the adoption of these new rules for entering mines is the discovery of gold-bearing banks and streams above the river Prinzapolka, which discharges into the Caribbean sea about 60 miles north of Bluefields, its course from the mountains being in a southwesterly direction and passing through the Mosquito Reservation. The discovery was made at the end of 1888, about 150 or 200 miles from the Caribbean coast, and the fields are not to be reached except by tedious travel in canoes and on the backs of Indians. The section was reported on by a Government expert and a new district was created. It is to this district the new laws apply.

Electric Power in Mining.

In another column our correspondent in El Dorado county describes briefly the electric plant for power at the Dalmatia mill, the first complete one in the State. The generator, operated by a Pelton water-wheel, is three miles (not one mile, as stated) from the mill, and from a pulley on the motor at the mill, a belt carries the power direct to the main shaft, driving the rock-breakers, Huntington roller mills and stamps. Another 20-stamp mill is to be connected with the same power. A three-nozzle Pelton wheel runs also a complete electric light plant, with which the mill is lighted.

There has been more or less talk about operating mining plants by electricity in California, but this is the first complete electric power outfit applied to mining in the State. There are many other places where water power is within a reasonable distance of the mine or mill, where the same system could be applied with great advantage. No difficulty is found in conveying the electric power the three miles from the source. The machinery is as easily controlled as if run by steam or direct water power. It will repay all those who have available water power within a few miles of their mines, to go personally and see the Dalmatia mill, so as to inspect this successful electric power plant.

Mines in the Argentine Republic.

In regard to the mines and mining of the Argentine Republic, it is the same old story—no one has yet discovered the bonanza. With all the outlay of capital and machinery which has been going on for the past ten years, the returns are yet of the most meager description. The gold from Terra del Fuego was all taken from the neighborhood of San Sebastian bay, on the east coast, and Mr. Julio Popper, the mining engineer in charge, is sanguine that a big find of dust will be yet made from the diggings along the Outler river or Carman Silver Mountains. Yet the whole country only produced $75,000 in gold in 1888, and $32,755 in the first nine months of last year. It produced, however, bismuth, copper, tin, silver, lead and borax. Its borax was worth $679,024 in 1888 and $547,070 in the first nine months of 1889. The total value of all mineral products for 1888 was $1,526,057, and for the first nine months of 1889 $1,399,295.

Hundreds of companies have been organized to search for gold, but they need coal more than gold down there. The U. S. Consul says that if some real "live Yankees" would go to Buenos Ayres and set up in the coal business, there would be more money in it than in mining. All the railways and industries of the Republic are at present dependent on foreign coal.

Those Americans in a position to speak say the country is no place for emigrants from the United States, except for capitalists who propose to engage in commercial pursuits or the business of sheep or cattle farming on a large scale. The public lands are sold at auction by the square league, and it is only moneyed men or speculators who can afford to buy them in.

San Bernardino County.

In this issue we present to our readers the first number of a series of articles on the resources of San Bernardino county, from the pen and observations of J. H. Crossman, who visited that county last year in the interest of the California State Mining Bureau, as assistant to William Irelan, Jr., our State Mineralogist.

Mr. Crossman has also in preparation a much-needed and reliable map of San Bernardino county, with profile and sections of the desert regions. The map will be published in the MINING AND SCIENTIFIC PRESS as soon as completed. It will be comprehensive, as well as from notes taken on the field, showing the mineral districts and mines, proposed railroad routes, mountain ranges and lines of volcanic disturbance, etc. In fact so far as practicable, the geographical, topographical and mineralogical features of the almost unknown desert region will be shown on a scale sufficiently large to be of service to the prospector and miner. Township and section lines will be shown and many errors corrected that exist in all maps in use at date, even those issued by the U. S. Government. Survey lines having been run since 1856, when the desert region was triangulated by a few corners stuck in the valley desert region, but no section lines run in the mountain ranges.

The descriptive matter in Mr. Crossman's articles will give the general features of the country and enter into many details concerning its mineral and industrial resources.

"INDUSTRIAL EDUCATOR."—At the meeting of the Oakland Board of Education Tuesday evening, Ronald B. Gleason of Oamhridge, Mass., was elected to the position of Industrial Educator, a position recently created in the public schools of Oakland. The salary was fixed at $1800 per annum.

Academy of Sciences Building.

(*Concluded from page 17.*)

end fireproof casements, lighted by a well on the west side, covered by a glass skylight at the top of the shaft. A large light-well over the staircase and hallway affords abundant light to both on every story. The fire-hose closets are arranged on each floor near the elevator-shaft, and the sanitary arrangements are also complete on all seven stories.

From this description it will be seen that the front building is a first-class store and office structure, of which there are many similar ones in the city. The rear building is of more interest to the majority, and will be a museum and scientific repository equaled by few in this country. While the front structure is to be fire-resisting, the rear one is absolutely fireproof in the fullest meaning of the word. There is no wood whatever used in its construction except for the mere floor coverings in the upper part of the building. The ground floor is devoted to an assembly hall, the second to a museum, and the four upper floors are merely galleries running round all four walls and connected by an iron staircase from the second story up.

The approach to the academy is made a specially attractive feature. At the end of the main hallway a bold arch resting on double columns of white marble opens on to a low flight of white marble steps rising to a spacious landing, at the end of which a shrinelike niche forms a fitting receptacle for a bust or medallion of James Lick, with a record of the bequest beneath it. The balustrade, all of marble, is richly carved. It is bold in design, in keeping with the Romanesque exterior, and is one of the handsomest staircases in the country. From the landing another short staircase rises on the left to a second landing, opening on the museum floor, all the stairs being of marble. The space occupied by these stairs and landing is canopied by a beautifully finished glass roof under the dividing light-well, behind the partition wall of the buildings.

The lighting of this rear building has received special attention—on the Pioneer place, or east side, a frontage of 50 feet; on the west side, a light-well 50 feet long, corresponding with that frontage; on the north the well 80 feet long; on the south the Stevenson-street frontage, and the skylight on the top of the building 70 feet long all contribute to this end. The galleries, corridors and passages will thus be flooded with light at all times.

Passing round the foot of the staircase on the ground floor and to the right, ingress is afforded to a broad marble corridor which encircles the assembly hall on three sides. This hall will stand of itself inside the building and have a sloping amphitheater of seats, with a raised platform at the south end. The roof of the hall, which forms the museum floor, is to be Romanesque, as well as all of the decorations. Heavy columns and boldly projecting beams forming deep panels in the ceiling, fireproof walls lighted by stained-glass side-windows looking out on the corridors, and doors handsomely carved, all contribute to make the temple of science strikingly handsome.

On the same floor at the left of the hall, and along the slanting wall of the Pioneer building, there will be a good sized reception-room for smaller meetings, and behind it, as well as along the Stevenson-street side, space for toilet-rooms is to be provided.

The museum and galleries forming the five upper stories need no special description, the chief point in their design being their fitness for the uses to which they are to be put. The galleries are to be 20 feet wide all round, carried on columns continued from the lowest story through to the roof. The estimated cost of the entire building, front and rear, is $280,000.

It is a matter of pride for San Francisco, one of the youngest of the large cities of the United States, to have so fine a building devoted to science. With the money that will come in due time from the Lick estate and the income afforded by the store-portion of the building, the California Academy of Sciences will be one of the wealthiest private institutions of the kind in the Union. Its members have passed through many struggles of a financial nature since its organization in 1853, but on the completion of the building the institution will be on a footing which will greatly enlarge its usefulness.

Mono Lake.

Lake Mono is situated in east-central California, within a few miles of the California-Nevada border. The lake is 6380 feet above sea level. The Mono basin is remarkable for its diversity of topography, its varied and striking contrasts of scenery, its wide range of climate and corresponding variations of flora. Besides these more obvious characteristics, the basin has a varied geological history, the later chapters of which are of fascinating interest and can be read with unusual facility.

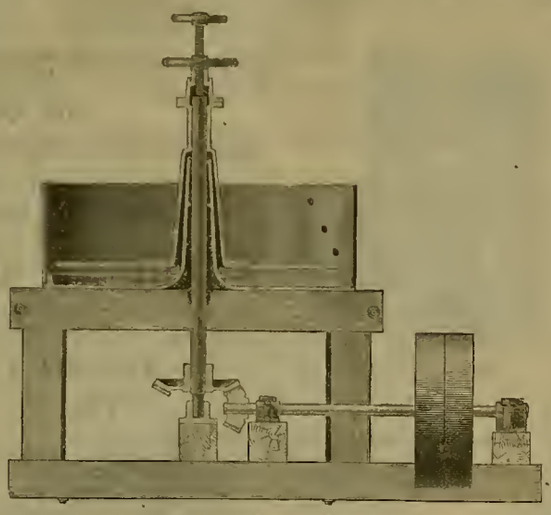
The highest peaks that overshadow the lake rise more than 6000 feet above its level. Over the entire area of the basin no running water can be found during the greater part of the year, and the region is consequently silent and lifeless. Near the shore of the lake are low hills with castellated summits which at once attract the attention of the geologist by the peculiarities of their forms. These are tufa crags, mainly composed of calcium carbonate which was deposited from the waters of the lake when it stood much higher than now. There are three varieties of this tufa, tubular masses being sometimes formed, that appear to have been precipitated from springs.

The lake is rudely circular in outline, and, including its islands, has an area of 87 miles. The average depth is about 62 feet, and the greatest 152 feet of water. The entire bottom is of soft black mud. The most remarkable features of the lake are the absence of an outlet and the strongly alkaline condition of its water. The lake derives the principal portion of its water supply from the creeks that descend the slope of the Sierra, and supplementing this surface drainage are a number of springs, many of them warm ones.

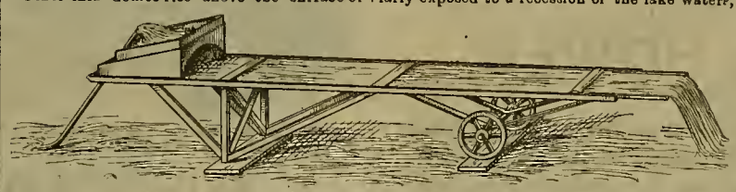
At the western extremity of the lake are several sublacustral springs. Two of special interest rise at the base of tufa crags 20 or 30 yards from the lake shore. At the present time they are not depositing mineral matter though the tufa about them was evidently deposited by them. The positions of the springs rising in the lake near Black Point, are indicated in calm weather by the eddies on the lake surface. On rowing over these submerged springs it is seen that some of them rise from the tops of tufa crags which are covered by 10 or 12 feet of water. These crags are of the same character as those on the shore and were formed by the deposition of calcium carbonate from the incoming waters. The submerged towers from which these springs issue are in some instances eight and ten feet in diameter and 20 or 30 feet high. They are clustered in groups in the same manner as the tufa towers and castle-like masses which have been left exposed by the receding waters of the lake.

Unlike the masses that have been exposed to the atmosphere, their forms are unbroken. The upward rush of fresh water from the orifices in the summits of these sublacustral towers is often strong enough to deflect a boat when allowed to float over them.

Other tufa domes rise above the surface of the lake near the shore and add an interesting and rural feature to the scenery. A group of these domes seen from the shore near Black Point, looking toward Mt. Warren, is shown in the accompanying engraving which we reproduce from "The Quarternary History of Mono Valley," by Israel C. Russel, published in the U. S. Geological Survey Report. These domes rise in water that is 10 or 12 feet deep to a hight about 12 feet above the surface. Many of them are vase-shaped, as shown in the illustration, being smallest at the water's surface, and nearly circular in outline. The more symmetrical ones appear not unlike huge specimens of the sponge, known as "Neptune's Cup." The tops of several are hollowed out so as to form basins, and in a few instances these depressions are filled with clear, fresh water that rises through the porous and tubular tufa comprising the submerged shaft of the structure. These are typical specimens of sublacustral spring deposits which have been left particularly exposed to a recession of the lake waters, but are still points of discharge for the springs that built them. The water of one of these natural fountains rising in a lake whose water is utterly undrinkable is of exceptional purity. The only other instance where fresh-water springs have built up islands in a saline lake is in Lake Texcoco, Mexico.



CLEAN-UP PAN FOR WORKING AMALGAM.



BEACH BLACK-SAND GOLD SAVING MACHINE.

TUFA TOWERS NEAR BLACK POINT IN MONO LAKE.

A POCKET.—A *News* special from Tincup, Col., gives an account of a wonderful discovery of gold ore. The find is six miles from Tincup, on Cross mountain, and is owned by McCormick & Lewis. A good many men are going to the camp, but ore reported as assaying $20,000 to the ton is not apt to make a permanent camp. They have probably struck a pocket like many of the Tuolumne county mines show in this State. These people have, however, figured up a yield into the billions, figuring on the whole ledge 1000 feet deep and 1500 feet long as being almost a mass of gold.

Gold From Beach-Sand.

One of the forms of machines used in washing the auriferous sands of the ocean beaches of Humboldt and Del Norte counties in this State, is shown herewith. The machine is portable, being moved about on wheels from place to place on the beach. Water from a reservoir at a greater elevation, is supplied by a hose, a supply of from three to four miners' inches being required. The water flows from the hose into the hopper, which is provided with a perforated iron bottom. The black sand as collected from the beach is shoveled into the hopper with the water.

The table or sluice-box, 18 feet long by 18 inches wide, is set to a grade of six inches, and is covered with silver-plated amalgamated plates. Cross riffles one inch in hight are put on this to check the flow.

This appliance is quite simple in construction and operation, and being readily moved about, is found to be effective. Of course a gravity water supply is necessary, so it can not be used on all beaches. At the Gold Bluffs of the Northern California coast the black sands are washed in these machines, but care must be taken as to the flow of water, as the gold is very fine and there is very little difference in its specific gravity and that of the black sand in which it is found.

Clean-up Pan.

The accompanying cut gives a sectional view of a clean-up pan for quartz mills. In these pans, the amalgam is worked with additional quicksilver and the waste matter washed off before retorting. Wooden shoes are attached to the arms and they are adjusted by means of the band wheels on top of the driving spindle to bear on the bottom of the pan or not as desired, the motion being communicated through the bevel gear underneath the spindle. The Fulton Iron Works of this city also build these pans heavier for grinding or they may be used in prospecting, and also for brightening small quantities of concentrates from blankets and sluices that they may be taken up by the quicksilver.

CHINESE GOLD MINING.—Two of the Chinese cabin passengers on the Gaelic Wednesday were Tong Sing Kow and Wong Leong, who represent a Chinese mining syndicate and are here for the purpose of buying machinery to work gold mines in the Sangtang mountains. Kow says the mines are very rich, assaying $18 of gold to the ton and $8 of silver. He says that he will purchase several hundreds of thousands of dollars worth of machinery, and will buy it in this city if the strike does not prevent his having his orders filled.

FOR the coming Mechanics' Fair, many applications for space are being made. The rules and premium lists have just been distributed and have served as a great incentive to intending exhibitors, and applications are coming in freely. Owing to the fact that the Native Sons have secured the pavilion for their celebration of September 9th, the fair will not open until the 18th of that month.

A SHIPMENT of 13 bars of bullion, valued at $56,605.83, has been made from the Con. Cal. and Virginia mine to the Carson Mint. This is the final shipment of June account, making a total for the month of $179,255.07.

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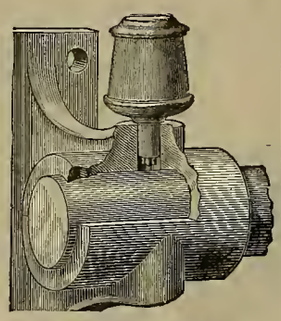

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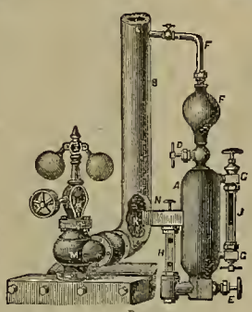

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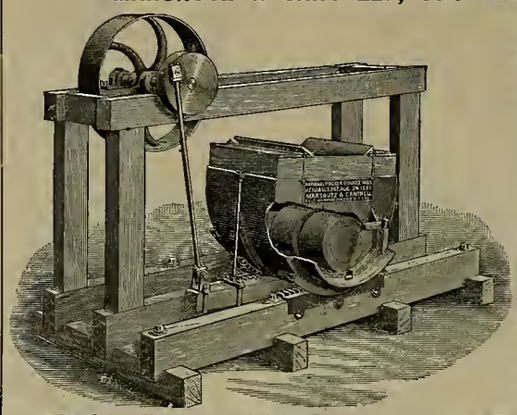

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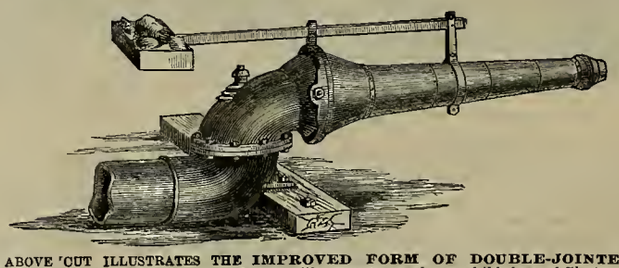

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Hoisting Engines, Safety Cages, Safety Hooks,

ORE CARS, WATER & ORE BUCKETS,

Air Compressors, Rock Drills, Etc.

GENERAL MILL AND MINING SUPPLIES, ETC.

Sectional Machinery FOR MULE-BACK TRANSPORTATION.

Pumping Engines and Cornish Pumping Machinery,

IMPROVED WATER JACKET

Blast Furnaces for Galena & Copper Ores,

SLAG CARS AND POTS,

Roots & Baker Pressure Blowers,

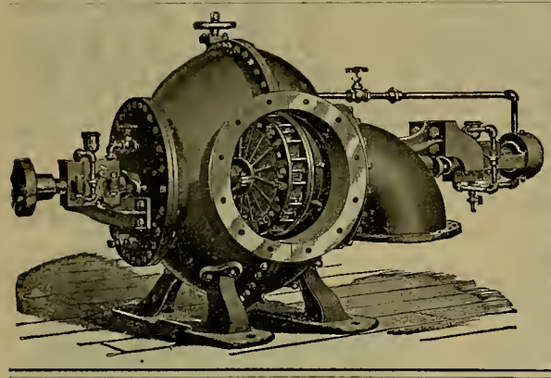
SUSPENDED TRAMWAYS.

General Offices and Works: FULTON AND UNION STS., CHICAGO, ILL.

BRANCH OFFICES: NEW YORK, Room 43, No. 2 Wall St. DENVER, COLO., 1316 Eighteenth St. SALT LAKE CITY, UTAH, 7 W. Second South St. LONDON, ENG., 23 Bucklersbury, E. C. CHIHUAHUA CITY, MEXICO, No. 11 Calle de Juarez. LIMA, PERU, South America. JOHANNESBURG, TRANSVAAL, South Africa.

HELENA, MONTANA, Room 28, Merchants' National Bank Building, No. North Main St.

SOLE WESTERN AGENTS FOR TYLER WIRE WORKS DOUBLE CRIMPED MINING CLOTHS.



JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,
Springfield, Ohio, or 110 Liberty St., New York.

FRASER & CHALMERS, General Agents, Chicago, Ill., and Denver, Col.

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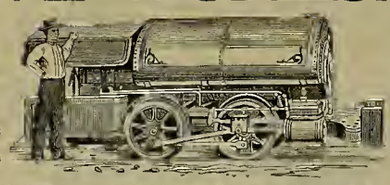
BALDWIN LOCOMOTIVE WORKS.

ANNUAL CAPACITY 800. ESTABLISHED 1831.

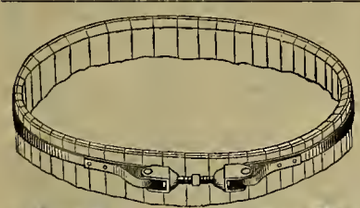
LOCOMOTIVE ENGINES!



Adapted to every variety of service, and built accurately in standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Broad and Narrow Gauge Locomotives, Mine Locomotives by Steam or Compressed Air, Plantation Locomotives, Noiseless Motors for Street Railways, Furnace Locomotives, etc.

BURNHAM, PARRY, WILLIAMS & CO., PROPRIETORS, PHILADELPHIA, PA.



BAND COUPLING.

Best in the World. Most Simple in Application. Most Powerful—Cheapest. Ball and Socket Joint. Right and Left Screw. Works Freely. Just the thing for Large Tanks in a Dry Climate.

WELLS, RUSSELL & CO., Tank Builders
Mechanics' Mills, Cor. Mission & Fremont Sts., S. F.

TUBBS CORDAGE CO.
(A Corporation.)

Constantly on hand a full assortment of Manila Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice.

611 & 613 Front St., San Francisco, Cal.

Postmasters are requested to be sure and notify us when this paper is not taken from their office. If not stopped promptly through oversight or other mishap), do us the favor to write again.

ESTABLISHED 1866.

Pacific Chemical Works.

HENRY G. HANKS,
Practical and Industrial Chemist, Assayer and Geologist,
718 MONTGOMERY ST., - SAN FRANCISCO.

Will report on the condition and value of any mining property on the Pacific Coast. Rare Chemicals made to order. Instructions given in Assaying and Practical Chemistry.

THOMAS PRICE & SON,

Assay Office, Chemical Laboratory,

BULLION ROOMS and ORE FLOORS,

524 Sacramento Street, San Francisco, Cal.

COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.

WORKING TESTS OF ORES BY ALL PROCESSES.

SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.

GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

MANUFACTURERS OF
BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, Etc., Etc.
ALSO MANUFACTURERS OF
Standard Shot-Gun Cartridges,
Under Chamberlin Patent.

JOHN TAYLOR & CO.,
IMPORTERS AND DEALERS IN
ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,
ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.
63 & 65 First St., cor. Mission, San Francisco.

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

M.C.C. BATTERSEA

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents for the Morgan Crucible Co., Battersea, England. Also for E. G. Dennistoun's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.
NO. 28 STEVENSON STREET,
Near First and Market Streets, S. F.
C. A. LUCKHARDT, Manager. ESTABLISHED 1869.

Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.

C. A. LUCKHARDT & CO.,
(Formerly Huhn & Luckhardt,
Mining Engineers and Metallurgists

GREAT REDUCTION!

BATTERY SCREENS.
Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.

PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut or hurred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

San Francisco Pioneer Screen Works,
221 & 223 First St., San Francisco, Cal.
JOHN W. QUICK, Proprietor.

WINCHESTER HOUSE,
44 Third Street, - San Francisco, Cal

This Fire-proof Brick Building is centrally located, in the healthiest part of the city, only a half block from the Grand and Palace Hotels, and close to all Steamboat and Railroad Offices.

Laundry Free for the use of Families.

HOT AND COLD BATHS FREE.

Terms, Board and Room, $1.00 per Day
And Upward.
Rooms with or without Board,
Free Coach to the House
J. POOLEY.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 10, 1890.

Now that the midsummer bolidays are past and harvest work is nearly over, general trade is expected to sbow a decided improvement.

The money market is easy for tbe season of the year, and everything now points to its continuance. The fruit crop being marketed at higb figures, is throwing large sums of money into circulation. The wool clip is nearly all placed at satisfactory prices; and it now looks as if tbe cereal crops will be marketed at much better general average prices than were obtained last year.

Judging from the best obtainable statistical and other advices regarding wheat and barley, tbe average prices for the two cereals this season, over tbat of 1889-90 will he fully 25 per cent, and may go as high as 35 per cent.

The steamer City of Rio Janeiro, wbich left here for Hong Kong Tuesday, took out the following treasure: Mexican dollars, $80,233; gold coin, $14,895; gold dust, $659.

MEXICAN DOLLARS—The advancing markets for silver with the outlook favorable for still bigher prices causes strong holding of Mexican dollars. The market is quotable at 83@84¼cts.

SILVER—Tbe New York and London markets have steadily appreciated since the bolidays. The strong and bigher markets are due to the Senate and House Conference Committee on the silver bills having come to an agreement (in outline of the joint bill is given elsewhere) and reported the result. This bill, while not giving entire satisfaction owing to its still treating silver as a commodity, is considered to he as favorable as can be expected with the Administration opposed to the free coinage of silver. It is much better than many were led to hope for when tbey found out how strong tbe opposition was to silver. Bimetallists botb in and out of Congress deserve tbe greatest credit for the generalship displayed in presenting and prosecuting their favored cause. Under the discussion which it naturally produced, bimetallists proved more than a match for monometallists. This was due not only to their energy and ability, but also to their cause being founded on right and justice.

It is confidently claimed by those in position to know that tbe next Congress will pass a free coinage bill. This opinion is based on the fact that candidates running for Congress tbis fall will be pledged to vote in its favor, and those who refuse to be so pledged will undoubtedly meet with defeat. With free coinage assured in the near future, the price of silver ought to advance, but in the meantime it is likely that it will fluctuate.

New York telegrams came through to-day quoting silver in that market at $1.06. In our market the Mint has not resumed purchasing, but will do so on next Monday, when correct quotations can be given.

QUICKSILVER—Receipts the past week aggregate 168 flasks. The coast demand continues free, with a strong market ruling, both at home and abroad.

LIME—Receipts tbe past week aggregate 5052 bbls. Tbe demand is good, but not up to what it was at this time last year.

BORAX—Receipts the past week aggregate 227 ctls. The market is steady at unchanged quotations. The demand for Eastern shipment is lully up to wbat it was at tbis time last year.

LEAD—The market has held steady. Eastern advices report the market quiet with the tendency to more ease.

TIN—The market for both pig and plate is firm. The demand shows signs of falling off, which is natural, as the canning season draws to a close. New York advices report a strong spot market, hut lower for futures. English advices report that bear raids caused lower prices, but at the close a steadier tone appeared to have set in. Imports the past week aggregate 27,034 lbs. ingot from Australia, and 28,332 boxes plate from Liverpool. The exports by sea aggregate 34 000 lbs. plate to Victoria.

COPPER—Exports by sea the past week aggregate 24,729 lbs. copper matte to Liverpool. Our market continues very strong. Late Eastern mail advices continue to report strong statistical markets with Lake held at 17c, Arizona ingot at 15½, and 14¾@15c for common casting. *Iron Age* cablegrams from London under date of July 2d report as follows: "Demand for home consumption continues good, as also that from India, and statistics continue favorable, Visible supplies have decreased 9500 tons during the month."

IRON—Imports the past week aggregate 330 tons pig from Irondale and 100 ton from New York. Eastern mail advices report an easier tone owing to the consumption not being up to expectation. *Iron Age* says that "the position of the Charcoal Iron makers had been weakened somewhat by the cancellation of large orders from the Bessemer Steel people, who are understood to have paid a good bonus to be relieved. This released a much larger furnace capacity for the general trade than bad been anticipated." English cables report a better tone to the London market.

COAL—Imports the past week aggregate as follows: Nanaimo, 5854 tons; Biltimore 1825; Coos Bay, 300; Tacoma, 6786; Departure Bay 6938; Sidney 2416; Newcastle, N. S. W., 3990; Seattle, 1459; overland, 20; total, 29 588 tons. The strike at the Dunsmuir-Wellington mines is still on, and it is feared that unless it is settled soon there will be strikes in the other mines. With winter coming on, many dealers are beginning to express some uneasiness, fearing that with the Wellington mine closed, quite an advance will take place in both Coast and Australian.

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 9.—The following ars the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	47¾	1 04	$16 50	$4 50	$21 00
Friday	....	....	.....	.....	.....
Saturday	....	....	.....	.....	.....
Monday	47⅞	1 04½	16 65	4 50	20 85
Tuesday	48	1 04½	16 65	4 47½	20 85
Wednesday	48½	1 05½	16 60	4 47½	20 80

NEW YORK, July 9.—Borax firm at 8¾@9c. Quicksilver firm at 75@76c, Outside Copper dealers bought 200,000 lbs. lake at 15½c. Mining hands quote 17c, privilege of asking wire bars or cakes for August delivery. Arizona firm 15½c; casting, 14½c. Pig Lead quiet, $4.47½ bid and $4.50 asked.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 19.		WEEK ENDING June 26.		WEEK ENDING July 3.		WEEK ENDING July 10.	
Alpha	1.45	1.75	1.55	1.70	1.30	1.70	1.35	1 50
Alta	1.25	1.35	1 30	1.50	1.30	1.50	1.25	1.40
Andes	.70	.85	.75	.85	.65	.85	.65	.70
Belcher	2.90	3.35	3.00	3.55	2.50	3.50	2.75	3.30
Best & Belcher	3.40	4.25	3.70	4.25	3.15	4.20	3.35	4.50
Bullion	2.60	3.90	3.25	4.60	3.40	4.15	3.25	3.70
Bodie Cou	.50	.65	.50	.55	.55	1 45	1.10	1.45
Bulwer	....	....	.25	....	.25	.35	.25	.35
Commonwealth	3.60	3 70	3.50	3 65	3.55	....	....	....
Con. Va. & Cal	4.75	5.00	4.85	5.25	4.75	5.25	4.55	4.75
Challenge	2.60	3.50	3.30	3.70	2.60	3.60	2.75	3.55
Chollar	3.40	4.15	4.10	4.85	3.50	4.60	3.75	4.15
Confidence	7.00	7.50	6.75	7.37	5.00	7.25	7.25	7.50
Con. Imperial	.45	.53	.45	.50	.35	.50	.40	.45
Caledonia	.50	.55	.50	.65	.40	.65	.50	.55
Crown Point	2.90	3.15	3 00	3.50	2.50	3.45	2.70	3.25
Crocker	.25	....	.20	....	....	.20	.20	....
Del Monte	1.25	1.50	1.40	1.50	1.40	1.50	1.40	1.70
Eureka Con	4.00	....	3.95	4.00	....	....	....	....
Exchequer	1.05	1.40	1.30	1.50	.95	1.35	1.00	1.20
Grand Prize	.60	.70	.55	....	.60	.70	.65	.70
Gould & Curry	2.25	3.05	2.75	3.25	2.25	3.15	2.30	2.80
Hale & Norcross	2.55	3.70	3.35	3.85	2.70	3.55	2.85	3.50
Julia	.35	....	.35	.40	.30	.35	.25	.30
Justice	1.45	1.60	1.50	1.75	1.50	1.75	1.55	1.60
Keutuck	1.50	1.90	1.60	1.8	1.25	1.85	1.45	1.60
Lady Wash	.35	....	.35	.40	.35	.40	.35	....
Mono	.40	.50	....	.45	1.00	.60	.50	.80
Mexican	3.50	3.70	3.50	4.15	3 05	4.15	3.05	3.25
Navajo	.45	....	.40	.50	.50	.55	.60	.75
North Belle Isle	1.45	1.60	1.30	1.45	1.40	1.50	1.25	1.50
Nev. Queen	.95	....	.75	.91	.75	.90	.90	....
Occidental	1.50	1.75	1.50	1.85	1.45	1.85	1.65	1.85
Ophir	4.40	4.85	4.50	5.12	4.35	5.12	4.35	4.75
Overman	2.75	2.90	2.65	3 40	2 45	3.30	2.55	3.05
Potosi	5.25	9.50	7.25	10.12	7.52	9.25	7.62	8.50
Peerless	.25	....	.25	....	....	.25	.25	....
Peer	.25	....	.30	.25	....	.20	.20	.25
Savage	2 10	4.25	4.15	5.00	3.80	4.90	3.90	4.30
S. H. & M	2.05	2.30	2.15	2.45	1.60	2.40	1.70	2 20
Sierra Nevada	2 95	3.30	3.15	4.25	3.00	4.30	3.20	3.45
Silver Hill	.40	.50	.40	.50	.35	.50	.35	.40
Scorpion	.25	....	.25	....	....	.30	.25	....
Union Con	2.80	3.20	3.00	3.85	2.50	3.80	2.70	3.00
Utah	1.01	1.20	1.05	1.40	.93	1 40	1.05	1.20
Yellow Jacket	2.85	3.25	3.10	3.50	2.60	3.50	2 80	3.40

San Francisco Metal Market.

WHOLESALE.

THURSDAY, July 10, 1890.

ANTIMONY	22½@ —
BORAX—Refined, in carload lots	8 @ —
Powdered " " "	8 @ —
Concentrated " " "	7¼@ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheathing	23 @ 25
Ingot, jobbing	20 @ 18½
do, wholesale	17 @ 18
Fire Box Sheets	23 @ 25
LEAD—Pig	4¾@ 5½
Bar	5½@ —
Sheet	7 @ —
Pipe	6½@ —
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 65 @ —
Buck, ₱ bag	1 85 @ —
Chilled, do	2 05 @ —
QUICKSILVER—By the flask	58 00 @ —
Flasks, new	— @ —
Flasks, old	35 @ —
TINPLATE—B. V. steel grade, 14x20, to arrive	— @ —
B. V., steel grade, 14x20, spot	— @ —
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	5 00 @ —
do, do, 20x28	12 00 @ —
Pig tin, spot, ₱ lb	23½@ —
CHROME IRON ORE, ₱ ton	10 .00@ —
IRON—Bar, base	3 @ 3½
Norway, base	4½@ 5½

	Spot.	To Load.
IRON—Glengarnock ton	34 00 @ — —	33 @ —
Eglinton, too	34 00 @ —	30 @ —
American Soft, No. 1, ton	— @32 00	33 @ —
Oregon Pig, ton	— — @33 00	— @ —
Puget Sound	34 00 @ — —	— @ —
Clay Lane White	— — @28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	— @ —	@ —
Langloan	34 00 @ — —	32½@ —
Thorncliffe	34 00 @ — —	32½@ —
Gartsherrie	34 00 @ — —	33 @ —
Barrow	34 00 @ — —	32½@ —
Thomas	33 00 @ — —	— @ —
Cargolleet	30 00 @ — —	30 @ —

Coal.

TO LOAD.

	Per Ton.		Per Ton.
Australian	7 50 @ 7 75	Lehigh Lump	15 50@17 00
Liverpool Steam	8 00 @ 8 25	Cumberland bk	13 50@ — —
Scotch Splint	8 25 @8 37½	Egg, hard	15 00@ — —
Cardiff	8 50 @ — —		

SPOT FROM YARD.

Wellington	$ 9 00	Seattle	6 50
Oreta	8 50 @ 9 00	Coos Bay	5 00
Westminster Brymbo	9 00	Cannel	12 00
Nanaimo	9 00	Egg, hard	16 00
Sydney	8 50 @ 9 00	Cumberland, in sacks	15 00
Gilman	5 50	do, bulk	15 00

CANADIAN ANTHRACITE COAL.

Egg, ship side	$12 50	Stove, yard	$15 00
Egg, yard	15 00	Nut, yard	15 00

COKE.

English, to load	$12 00@13 00
English, spot, in bulk	13 50@15 00

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Belcher M Co	Nevada	49	50	June 27	July 31	Aug 21	C L Perkins	327 Pine St
Bodie Tunnel Co	California	16	25	May 24	June 25	July 15	C C Harvey	303 California St
Bodie Cous M Co	California	12	25	June 16	July 23	Aug 22	B. L. Darling	309 Montgomery St
Cous New York M Co	Nevada	3	15	May 22	June 26	July 17	C E Elliott	309 Montgomery St
Cous Pacific M Co	California	12	10	Jun 21	July 28	Aug 20	F E Luty	330 Pine St
Crescent M & M Co	California	4	25	Jun 24	Aug 2	Aug 29	J H Isham	310 Pine St
Crocker M Co	Arizona	9	15	June 16	July 25	Aug 25	N T Messer	309 Montgomery St
Cruikshank G M Co	California	1	10	Jun 27	Aug 14	Aug 25	E J Koch	211 Sansome St
Found Treasure M Co	Nevada	6	25	May 22	June 27	July 18	S Stadfield, Jr	309 Montgomery St
Golden Fringe Con M Co	Nevada	4	25	Jun 19	July 30	Aug 18	C D Bennett	330 Pine St
Gray Eagle M Co	California	18	5	July 1	Aug 4	Aug 25	J M Buffington	303 California St
Holmes M Co	Nevada	16	28	May 13	Jun 24	July 15	O E Elliott	309 Montgomery St
Mayflower Gravel M Co	California	47	30	June 7	July 10	July 31	J Mo lzio	328 Montgomery St
Silver King M Co	Arizona	3	20	June 9	July 17	Aug 11	A Waterman	309 Montgomery St
Standard Cons M Co	California	3	50	June 9	July 15	Aug 14	J W Pew	310 Pine St
Tierakoff G M Co	California	4	1	June 9	July 26	Aug 23	W J Garnett	318 Pine St
True Cous M Co	California	9	2	May 25	July 21	Sept 15	J C Bates	434 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Benton Cons M Co	California	V B Allen	330 Pine St	Annual	July 30
Best & Belcher M Co	Nevada	L Osborn	309 Montgomery St	Annual	July 14
Carmelo Land and Coal Co	California	W T Baggett	415 Montgomery St	Annual	July 21
Savage M Co	Nevada	E B Holmes	309 Montgomery St	Annual	July 14
Tuscarora Cons M Co	Nevada	J Scoville	309 Montgomery St	Annual	July 17
Union Cous M Co	Nevada	A W Burrows	303 California St	Annual	July 21
Yellow Jacket M Co	Nevada	W H Blauvelt	Gold Hill	Annual	July 21

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cous M Co	Mexico	G Gaio	309 Montgomery St	25	Apr 5
Caledonia M Co	Nevada	A S Cheninant	328 Montgomery St	05	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	Jun 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	July 10

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Alpha	1.45	1.75	1.55	1.70	1.30	1.70	1.35	1 50
Alta	1.25	1.35	1 30	1.50	1.30	1.50	1.25	1.40
Andes	.70	.85	.75	.85	.65	.85	.65	.70
Belcher	2.90	3.35	3.00	3.55	2.50	3.50	2.75	3.30
Best & Belcher	3.40	4.25	3.70	4.25	3.15	4.20	3.35	4.50
Bullion	2.60	3.90	3.25	4.60	3.40	4.15	3.25	3.70
Bodie Cou	.50	.65	.50	.55	.55	1 45	1.10	1.45
Bulwer	....	....	.25	....	.25	.35	.25	.35
Commonwealth	3.60	3 70	3.50	3 65	3.55	....	....	....
Con. Va. & Cal	4.75	5.00	4.85	5.25	4.75	5.25	4.55	4.75
Challenge	2.60	3.50	3.30	3.70	2.60	3.60	2.75	3.55
Chollar	3.40	4.15	4.10	4.85	3.50	4.60	3.75	4.15
Confidence	7.00	7.50	6.75	7.37	5.00	7.25	7.25	7.50
Con. Imperial	.45	.53	.45	.50	.35	.50	.40	.45
Caledonia	.50	.55	.50	.65	.40	.65	.50	.55
Crown Point	2.90	3.15	3 00	3.50	2.50	3.45	2.70	3.25
Crocker	.25	....	.20	....	....	.20	.20	....
Del Monte	1.25	1.50	1.40	1.50	1.40	1.50	1.40	1.70
Eureka Con	4.00	....	3.95	4.00	....	....	....	....
Exchequer	1.05	1.40	1.30	1.50	.95	1.35	1.00	1.20
Grand Prize	.60	.70	.55	....	.60	.70	.65	.70
Gould & Curry	2.25	3.05	2.75	3.25	2.25	3.15	2.30	2.80
Hale & Norcross	2.55	3.70	3.35	3.85	2.70	3.55	2.85	3.50
Julia	.35	....	.35	.40	.30	.35	.25	.30
Justice	1.45	1.60	1.50	1.75	1.50	1.75	1.55	1.60
Keutuck	1.50	1.90	1.60	1.8	1.25	1.85	1.45	1.60
Lady Wash	.35	....	.35	.40	.35	.40	.35	....
Mono	.40	.50	....	.45	1.00	.60	.50	.80
Mexican	3.50	3.70	3.50	4.15	3 05	4.15	3.05	3.25
Navajo	.45	....	.40	.50	.50	.55	.60	.75
North Belle Isle	1.45	1.60	1.30	1.45	1.40	1.50	1.25	1.50
Nev. Queen	.95	....	.75	.91	.75	.90	.90	....
Occidental	1.50	1.75	1.50	1.85	1.45	1.85	1.65	1.85
Ophir	4.40	4.85	4.50	5.12	4.35	5.12	4.35	4.75
Overman	2.75	2.90	2.65	3 40	2 45	3.30	2.55	3.05
Potosi	5.25	9.50	7.25	10.12	7.52	9.25	7.62	8.50
Peerless	.25	....	.25	....	....	.25	.25	....
Peer	.25	....	.30	.25	....	.20	.20	.25
Savage	2 10	4.25	4.15	5.00	3.80	4.90	3.90	4.30
S. H. & M	2.05	2.30	2.15	2.45	1.60	2.40	1.70	2 20
Sierra Nevada	2 95	3.30	3.15	4.25	3.00	4.30	3.20	3.45
Silver Hill	.40	.50	.40	.50	.35	.50	.35	.40
Scorpion	.25	....	.25	....	....	.30	.25	....
Union Con	2.80	3.20	3.00	3.85	2.50	3.80	2.70	3.00
Utah	1.01	1.20	1.05	1.40	.93	1 40	1.05	1.20
Yellow Jacket	2.85	3.25	3.10	3.50	2.60	3.50	2 80	3.40

Sales at San Francisco Stock Exchange.

THURSDAY, July 10, 9:30 A.M.

150	Alpha	1.40	
100	Alta	1.30	
400	Belcher	3.15	
500	Belle Isle	1.75	
330	Best & Belcher	4.00	
200	Bodie	1.10	
450	Bullion	3.20@3.25	
100	Bulwer	25c	
200	Challenge	3.25	
300	Chollar	3.80	
40	Con. Cal. & Va	4.55	
200	Confidence	7.00	
1000	Con. Imperial	40c	
200	Crocker	20c	
200	Crown Point	3.05@3.10	
230	Del Monte	1.75@1.85	
200	Exchequer	1.00	
350	Gould & Curry	2.65	
500	Grand Prize	65c	
300	Hale & Nor	3.15	
250	Hendricks	40c	
100	Iowa	85c	
50	Julia	30c	
200	Justice	1.55	
100	Lady Washington	35c	
250	Mexican	3.40	
100	Mono	60c	
100	Nava o	75c	
50	Nevada Queen	1.00	
100	North Belle Isle	1.50	
900	N. Commonwealth	2.80	
50	Occidental	1.75	
100	Ophir	4.55	
100	Overman	2.90	
300	Peerless	30c	
900	Savage	4.30@4.35	
400	Seg. Belcher	2.00	
300	Sierra Nevada	3.70	
90	Silver King	65c	
150	Union	3.10	
150	West Comstock	40c	
570	Yellow Jacket	3.30@3.35	

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Assessment Notices.

CARMELO LAND AND COAL COMPANY. Location of principal place of business, San Francisco, California; location of works, Monterey county, California.

Notice is hereby given, that at a meeting of ths Board of Directors, held on the 4th day of June, 1890, an assessment (No. 1) of Fifty (50c) Cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 10, No. 415 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of July, 1890, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on SATURDAY, the 9th day of August, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale

By order of the Board of Directors.

W. T. BAGOETT, Secretary.

Office, Room 10, No. 415 Montgomery street, San Francisco, California.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of Works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of July, 1890, an assessment, No. 18, of 6 cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of August, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 25th day of August, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California Street, San Francisco, California.

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DIVIDEND NOTICE.

The German Savings and Loan Society,
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For the half-year ending June 30, 1890, a dividend has been declared at the rate of five and forty-hundredths (5 40-100) per cent per annum on Term Deposits, and four and one-half (4½) per cent per annum on Ordinary Deposits. Payable on and after Tuesday, July 1, 1890.

GEO. TOURNY, Secretary.

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, June 30, 1890. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 33) of One Dollar ($1.00) per share was declared, payable THURSDAY, July 10, 1890, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer Books close July 5, 1890, at 3 o'clock P. M.

ALTON H. CLOUGH, Secretary.

ANNUAL MEETING.

THE ANNUAL MEETING OF THE STOCKHOLDERS of the Carmelo Land and Coal Company, for the election of a Board of Directors to serve the ensuing year, and for such other business as may come before the meeting, will be held at the office of the Company, Room 10, No. 415 Montgomery street, on MONDAY, the 21st day of July, 1890, at one o'clock P. M.

W. T. BAGGETT, Secretary.

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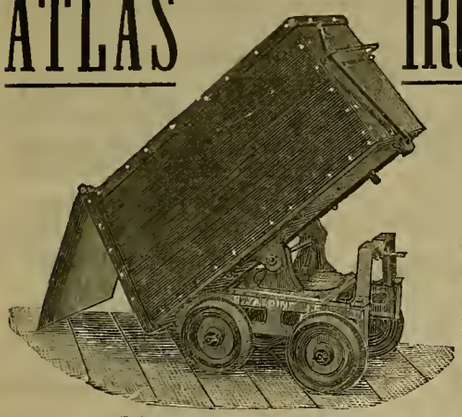

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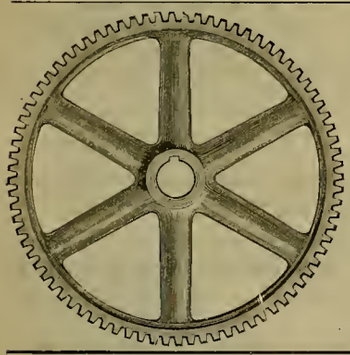

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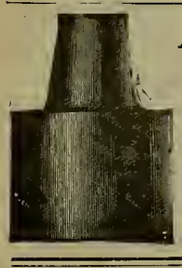

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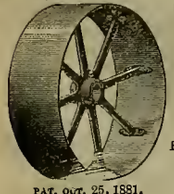

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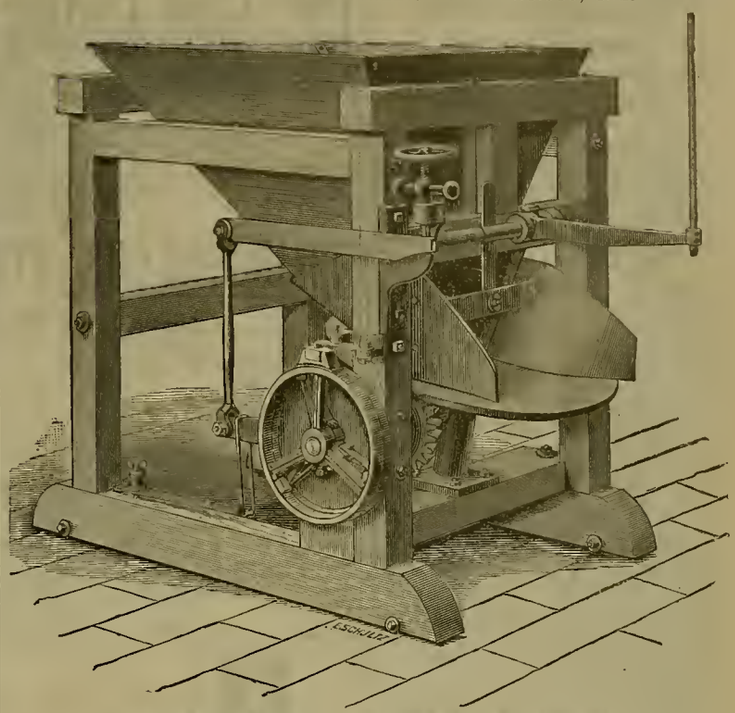

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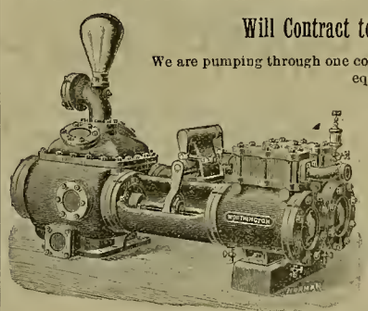

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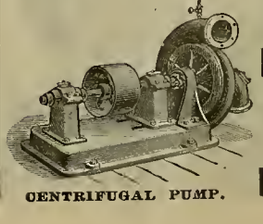

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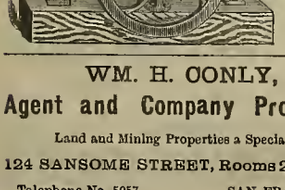

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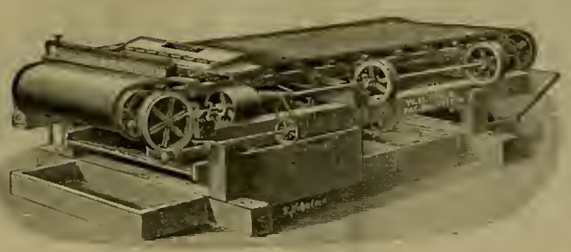

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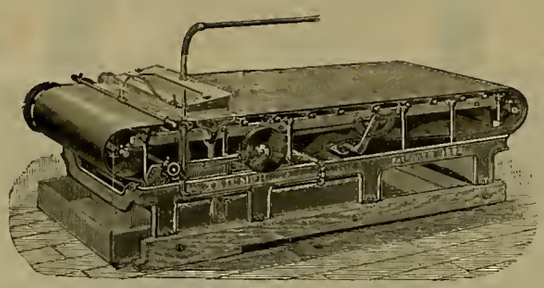

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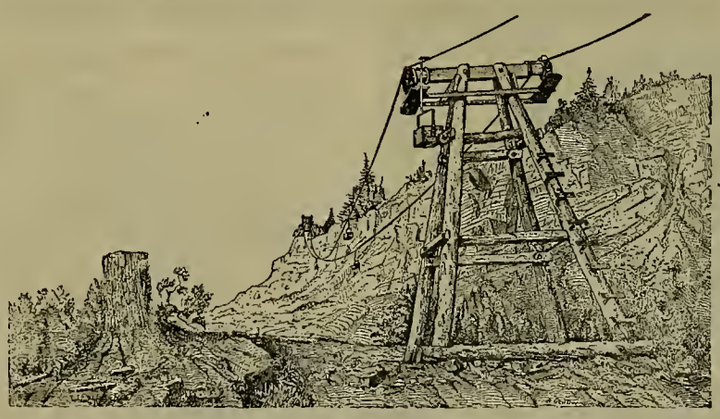

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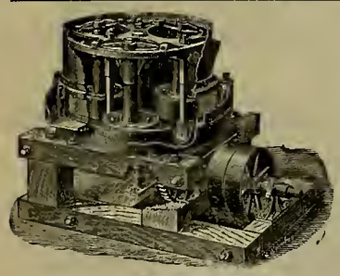

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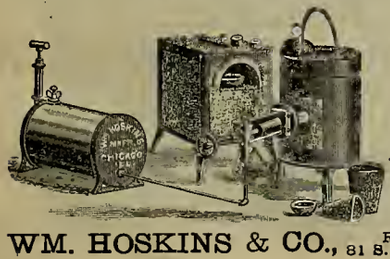

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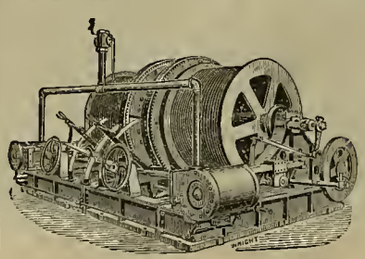

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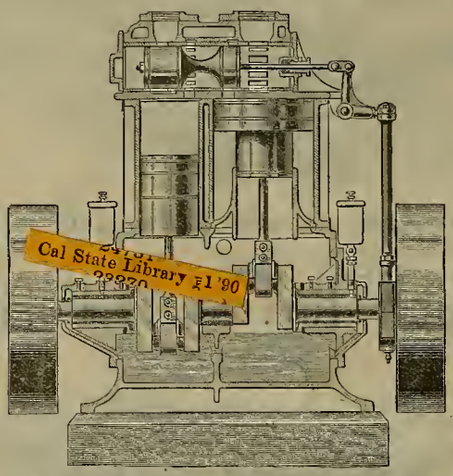

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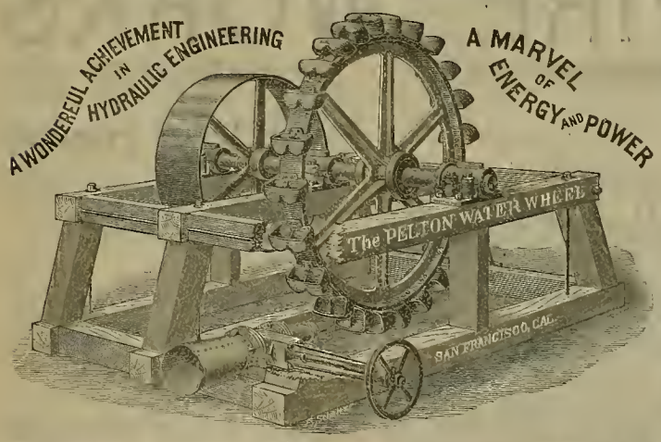
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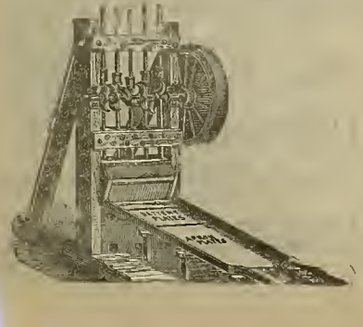

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GENERAL JOHN C. FREMONT, THE PACIFIC COAST "PATHFINDER."—See page 40.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Gold Belt of Northern California.

Ancient River Channels and Gravel Deposits.

NUMBER VI.

[Written for the MINING AND SCIENTIFIC PRESS by JAMES F. TALBOTT, Blue Canyon, Placer Co.]

The key of the situation appears to he hnrried here at Bear Valley. We account for the conditions obserued here by the eame line of theory started out on—that the flow of lava was the prime

Cause of the Great Change.

The indications are that the ancient river of the North Fork Dvide ran unobstructed through Bear Valley and down the Shady Run Ridge prior to the commencement of the lava flow; that the lava coming from a source to the eaat etrnck this river where Bear Valley now is. There are extensive lava deposits on the ridge above Emigrant Gap and along the C. P. R. for miles, whereas along on the South Ynba, and for miles beyond to the north, no traces of lava are seen. This shows conclusively that this flow came from some extensive volcano of the Sierras directly east of this point.

This heing the case, the natural result wonld be the accnmulation of a vast hody of water above during the active period of a flow. When, during the intervals of cessation, the pent-up waters would break over and cause heavy floods. The effects of some of these have been described as seen along the O. P. R. R. in the deep cnts above Shady Run. That there was

A High Rim

To the west of Bear Valley is evidenced hy the fact that granite bowlders 10 feet in diameter have been carried from here as far down as Prospect Cut on the railroad. We know these howlders must have come from this section of country for there is no granite wash fonnd outside the rimrock on this ridge. From alternating lava flow and flood the channel down the Shady Run ridge was filled up as far as Bear Valley in ahout the same way, and prohably at the same time that the channel in the Forest Hill ridge was filled np as far as the Brimstone plaine.

To complete the parallel, it is possible that at the same time the diverted waters were cutting ont a channel down the Iowa Hill ridge, nnder the same conditions the water here was outting out the ohannel down the Nevada ridge.

If the eonth hranoh of the North Fork had taken a more southerly conrse above Damascus, and cnt a deep channel through the Brimstone plains into Shirt-tail canyon and then made a sharp hend northward above the plains and out down 200 or 300 feet lower, as the South Ynha ahove Bear Valley, the two divides would he exactly alike from this point down, composed of the two main ridges each. In comparing the Nevada ridge with the Iowa Hill, we account for the disparity in extent and magnitnde from the facts that on the Middle Fork divide the greater hody of water was displaced to the south side into the Middle Fork, leaving less water on the north to out out the Iowa Hill channel; whereas, on the North Fork divide the main hody of water ran down the Nevada ridge, and was afterward displaced to the north into the South Ynha. A detailed description of the Nevada ridge would he a repetition of what has heen gone over in describing the other lava ridges, as all of the conditions are exactly the same. A general outline will be given, and a few prominent points noticed for the purpose of showing the apparent connection with the Shady Run ridge.

The Nevada Ridge.

One peculiarity of the Nevada ridge is that it starts from nothing in Bear Valley, widens and expands in its course westward, till it covers a vaet extent of foothill country, between the South Ynha and Bear river, and is lost in the plains below, and within the gold belt, away back in the early "50's," was noted for having the richeat gold mines in the known world.

In the northeast portion of Bear valley, nnmerous small lakes are seen, along between the reefs of hare bedrock that rise a few feet above the snrface. To the westward those reefs gradually rise a few hundred feet, and are swept bare of all loose material, except here and there a big granite bowlder has heen left on some pinnacle. Above this, these reefs terminate in a narrow, shrupt spur that rises 1000 feet within the limits of a mile. This is the commencement, on the east, of the great Nevada ridge, hetween the South Ynha and Bear river. You can follow along on this high bedrock, to the north, on the bluffs overlooking the South Ynha, about three miles; there you come to the Blue Tent ditch, which ruos in a hedrock tunnel, through a projecting spur, to the north. At no place along here can a veatige of lava be seen.

From this tunnel, the Blue Tent ditch runs in a southerly course, in bedrock, about a mile, then curves around the head of Diamond creek, where it takes a course due west, passing over a deposit of gravel and howldera 100 feet deep, cropping out from underneath several hundred feet of cement and lava. From Diamond creek to Omega, about three miles, the ditch runs over high, sharp hedrock spurs, which project northward to the Yuha river; and to the south, above the ditch, they dip under the lava cap. Here at Omega is

A Deep, Narrow Break

From the ridge (as proved hy shafts and tunnels not more than 400 feet wide). The outlet from this hreak formed the extensive and rich gravel deposit at Omega and Alpha, it being one continnous deposit till Scotchman's creek cut through ahont the middle. Below Omega, the Blue Tent ditch runs over bedrock spurs of the same character as those above, for a few miles westward, where it leaves them and cuts hack into the lava cap, which it follows to the top of the ridge.

The Centennial and other companies have run long hedrock tnnnels along on this side of the ridge, and not one of them is low enongh to hottom the channel. They have invarlably fonnd the bedrock pitching under the lava cap to the south. From all these facts, it is evident there is a high rimrock hetween the lava ridge and the South Yuha, from Blue Tent to Diamond creek, except only where some modern canyon has cnt through, or a break occurred when the channel was heing filled up.

On the South or Bear River Side

Of the ridge, as has heretofore been shown, there is a high rim from the lower end of Bear valley down to Liberty Hill, where there is an extensive hreak from the ridge at Lowell Hill, ahout a mile to the north, forming a gravel deposit which extends south to Liherty Hill, the latter heing a continuation of the deposit from Lowell Hill. A little down the ridge to the west is another hreak at Remington Hill, the outlet of which is into Steep Hollow, below Lowell Hill. Below Remington Hill going west is a rimrock hetween the lava cap and Steep Hollow for a few miles, then you come to where the extensive and rich gravel deposits at Chalk Bluff, Little York and others to the west crop ont from heneath the cement and lava. From this point to the west and north are numerous outlets from the main ridge, which formed a series of gravel deposits extending to Nevada City. This portion of the ridge is composed of long, narrow spurs formed by the modern canyons and creeks ontting hack into those gravel deposits. From all of the facts in regard to the lava cap inside the rimrock, it is evident there is an

Extensive Channel in the Nevada Ridge

And the lava flow from Bear valley, about the middle of the east line of T. 17 N., R. 11 east, extending to near Nevada City, ahout 20 miles to the westward, indicates the course and extent of this channel. From the conditions seen ahout the breaks at Omega and Diamond oreek, the flow that completely hlocked up the upper end of this ohannel must have heen excessive and long continued. At Omega the hreak appears to have heen filled up so suddenly that but a small amount of lava run ont over the gravel heyond the main flow in the ridge. At Diamond oreek the indications are that but a very short time elapsed hetween the hreak and its filling up. At the foot of the steep mountain of lava, great sqnare blocks of cement and lava, imhedded in and covered over with quartz, gravel and howlders, are seen abont the head of the oreek, right under a cliff, 200 feet high, of the same material from which those hlocks were broken off. Overlying and mixed with the quartz gravel here in placea is a peculiar kind of cement, composed of red clay, gravel and lava wash that appears to have heen mixed into a mass of mortar and haked, which gives it in color and consistence the appearance of a soft hrick.

This Same Lava Flow

That hlocked up the hreaks at Omega and Diamond creek, prohably was continnous till it was connected with the flow down Shady Run ridge, therehy forming a complete dam across where Bear Valley now is, and then ceased for all time. After thia, the vaat body of water accumulated ahove haa swept this lava dam away, leaving the lava walls on either aide of the valley pretty much the aame as they are seen to-day. To account for the conrae of the South Yuba here, there mnst have heen a bedrock country all aronnd, higher than thia lava dam, except at some point ahont on a level with it, where the river now rnns, at which point the water broke over at the same time as it did over the dam, thus dividing the pent-up waters and cotting down the Bear river and South Ynha gorgea at the same time. The conditions for erosion being more favorahle to the north, the South Ynha has cut down a few hundred feet lower than Bear river.

On the west, or lower end of Bear Valley is a shaft 80 feet deep, in a mase of howlders and gravel. Between a qnarter and half a mile east of this shaft is a well, sunk 100 feet deep in a sandy loam, free from gravel and howldera. Neither one reached the hed-rock. I can account for

These Remarkable Conditions

In hnt one way. That is, the conrse of the channel heing to the sonth here, the force of a large hody of water falling over the east rim would aweep everything off from that side, and the ontlet down the channel to the south heing blocked up hy the lava flow, the material waa lodged on the west rim wonld account for the gravel and bowlders in the shaft. Afterward, this onrrent of water was displaced into the South Yuha, leaving a small lake of clear water, which was gradually filled up with a sandy loam, snch as is seen on nnmerous bench-like terraces, aronnd the eastern portion of the valley, will acconnt for the material in the well. From all of the foregoing facts it mnst he evident that there is an extensive ohannel in each one of the main ridges of the North Fork divide. How are we to know which one contains the orlginal ancient channel? Of a number, one fact alone is sufficient to decide this point. In the Shady Run ridge the granite deposits are on, or near the top, and don't extend any great distance down. No granite wash has ever been fonnd on the hedrock in the mines on this ridge. On the Nevada ridge, however, extensive granite deposits are fonnd on the hottom, and massive granite bowlders are found on the bedrock in the mines from Diamond creek to Nevada City, which shows conclnsively that the wash down the latter ridge was subsequent to that of the former. This heing tha case, the channel in the Nevada ridge is a modern one, formed under like conditions as the Iowa Hill channel on the Middle Fork divide.

With reference to the viewa heretofore expressed, it may not seem ont of place here to devote some spaoe to the consideration of the

Source of this Great Lava Flow

That marked the end of this epoch. In reviewing the authentic accounts of remarkahle volcanic agencies in modern times, some facts indicate that at no remote time (geological), the volcanoes of the Sierras were active, and pouring their molten lava down the western slope of the steep and rugged mountain section, filling up all the gorges and depressions on its conrse, till it reached the gold helt, where it flowed into and down the ancient rivers "whloh gave it direction" throngh this belt.

There was a tradition of the old Digger Indians on this ooast, that the Great Spirit, on a time got angry at them, turned the snow into oil and set it on fire all along the summit, and hnrned all the rivers up, so that for a long time they oonld get no fish.

Capt. Dutton of U. S. A., Chief of the Bnreau of Volcanic Geology, relates instances in localities not very far from this, where violent erruptions have taken place and sent ont large quantities of lava and ashes, in recent times, in Washington Territory in 1843. In Utah and Sonthern Arizona are evidences of recent violent eruptions. He says: "I have seen lava here in which fragments of Indian pottery was imhedded, showing that the flow was snhsequent to the occupation of the country by Indians. A few years ago, I visited an extinct volcano in Northern California, which was so recent that some of the trees, killed hy the heat from the lava, had not entirely rotted away."

From the preceding facts it is obvious that

No Subsequent Glacial Action

Has taken place, for that would have destroyed all of the evidence hy which the lava flow can be traced to its sonrce. All along the npper side and to the east of the gold helt, on the North and Middle Fork Divides, from near the Sonth Ynha to the Middle Fork and branches to the south, can he seen heavy deposits of lava, between the high hedrock peaks and spurs that rise to the east. In some places the floods and modern canyons have carried some portion of it away, yet leaving evidence sufficient hy which it can he traced directly from the gold helt to the summit of the Sierras, where all traces of it are lost. From the history of volcanlo action in other parts of the world, we are led to the conclusion that the numerons lakes and valleys along the snmmit of the Sierras were once the seething craters of active volcanoes.

A correspondent writing to this paper a few years ago gives an acconnt of his visit to a crater of an extinct volcano in Japan. He says:

"It hardly seems possible that a person with open eyes, in broad daylight, could walk into the crater of a volcano without knowing it, especially when that crater is the object for which he is searching. Whichever way I turned there waa a wall almost perpendicular 1000 feet high; there were one or two breaks or gorgea throngh it. By one of these I had entered without noticing my snrronndings. This waa the crater of Azozan, 15 miles from wall to wall, containing within its walls miles and miles of cultivated fields and nnmerous villages. To think that this once seething firepit should become the scene of snch qniet rural life."

Many instances of remarkable volcanic action in other portions of the world might be given. But why not have something as wonderful in California as in Japan, or any other place? If within the walls of the crater of an extinct volcano in Japan are cultivated fields and villages, why not within the walls of a crater, full as large, of

An Extinct Volcano in California

Have a beautiful sheet of fresh crystal water, high on the mountain-top, surrounded by the grandest mountain scenery on the continent? To think of the impressive beauty and quiet of the surroundings of to-day where naught breaks the stillness but the woodman's ax in the mountain forest, or the merry laugh or song of the tourist and pleasure-seekers as they glide over the placid waters of Lake Tahoe in the little steamer; there, in ages gone by, within those mountain walls the roaring volcano blazed up from thousands of feet beneath this lake, and sent its floods of mud and torrents of boiling lava down the western slope that filled and blocked up the ancient rivers of the Middle and North Fork divides.

(To be Continued.)

San Bernardino County.

Its Mineral and Other Resources.

NUMBER II.

[Written for the PRESS by JAMES H. CROSSMAN.]

A Bedrock Dam.

An important enterprise in the desert regions, and one that is attracting much deserved attention, has been organized and is in process of construction—a submerged dam. The Silver Valley Land & Water Company has in process of construction a hedrock dam to conserve and utilize the subterrnnean waters of the Mojave river that have hitherto in the summer season run to waste by peroolation. Even in the dryest season this river flows a considerable body of water. It appears on the surface and again disappears eight several times before it finally sinks and disappears for the last time in Soda lake. Below Fish Ponds and above Daggett, this eccentric stream takes a plunge and is absorbed hy the pebbles and sands in its bed, to appear again 12 miles distant. This enterprising company has ascertained from repeated tests and measurements that the waters of the river do not enter any subterranean channel or fissure in the hedrock, but is simply absorbed hy the gravel as the sponge absorbs water. The company is building a snbmerged dam to the bedrock 1600 feet in length hy 12 feet in hight, at a point in the hed three miles above Daggett, for the purpose of arresting the snh-surface flow of this water and conveying it by canal and pipes to a point near Daggett, where it can he utilized for power for mills, reduction works and irrigation purposes. Cheap power is a desideratum where fuel is dear. Eighty stampa are in constant operation on the ores of Calico, the motive-power heing steam. The water of this new enterprise will be brought in at a sufficient elevation to utilize it for power. In the Calico mountains there are immense quantities of low-grade ore that could be profitably worked if cheaper power could be procured. It can also be nsed for irrigation purposes, there being large tracts of valuable agricultural land lying helow the point of discharge. The specifications of the work call for three miles of canal, 1400 feet of tunnel, 10,600 feet of pipe and 2000 feet of flnming. The canal will he 20 feet wide at the top, 15 feet on the hottom and four feet deep. Water will he taken out four feet below the surface at an elevation of 2015 feet above the sea and discharged at a hight of 1975 feet. The capacity of the canal is 15,000 miner's inches; grade, 14 feet to the mile. The dam will he hnilt of concrete, cement and atone. Its base will be on the bedrock of granite. Three reservoirs will he hnilt on the line of the canal, each of the capacity of 5 000,000 gallons, in order to conserve the surplus water of the rainy season.

Whenever railroad facilities can be secured this vast mineral country will pour forth her treasures and render the desert regions of San Bearnardino the most productive and prosperous mining region on the Pacific Coast, sustaining a large population of miners, tradesmen and mechanics that must of necessity, at least at present, draw their principal supplies from the fertile valleys that lie sonth of the San Bernardino range. The water so necessary to man's existence that is now only found in pools and springs will he drawn from snhterranean channels through the medium of artesian wells. That nnderground rivers exist there can he no question. Artificial reservoirs will also he constructed where needed and the conditions are suitable.

Timber and Fuel.

Providence, Kingston and Clark mountain ranges contain, at an altitude of ahout 4000 feet, considerable timber that can he utilized, hut below that level the cactus, jnniper, sage-hrush and shelac, together with iron wood and palo verde, form the only fuel available for domestic or power purposes. Fortunately the Gallup mines of New Mexico furnish an excellent quality of coal that is transported over the A. & P. R. R. and delivered at several points on its line where required for power for mille and reduction works at a cost not exceeding $9 per ton. Bnt whenever the Utah Southern shall have extended their lines through this desiccated region coal from the vicinity of Milford, Utah, of superior quality and quite equal for smelting purposes to the celebrated English and Australian, can he laid down at any point on the desert on the line of the road at a price not to exceed $6 per ton. Even $5 would pay the road a good profit. In that event smelting works on an extensive scale (similar to the works of Hills in Colorado) will be located at some central point for the reduction of the immense bodies of base and refractory ores which exist in this section of the country.

Beginning near the Bear and Holcomh Valley section, a helt of timher extends along the mountains almost to Cajon Pass. Red, black and sugar pines grow to a great size; also cedar and lesser trees. This timber helt is 45 miles long hy six miles wide, in which many hundred million feet of timher suitable for lumher are still standing in place. The seven steam sawmills on the mountains last year worked up five million feet. A wagon-road leads down from the mountain forest elevated 5000 feet above the level of the sea, and a narrow-gauge railroad is in process of construction to these regions.

In the desert, however, that lies north of the

San Bernardino range the scarcity of timber is a matter of serious consideration.

Towns.

The desert country north of the San Bernardino range contains the following mining and railroad towns: viz.: Victor, with 100 inhabitants; Oro Grande, 150; Barstow, 150; Daggett, 150; Calico, 400; Ivanpah, 25; Providence, 50; The Needles, 400. Each of these forms a base of supplies for interior mining districts. These towns contain variety stores with large stocks of goods suitable for their trade, hotels, saloons, churches and schoolhouses.

Temperature.

The desert has a mean temperature during the summer months of 90° Fahr., that is, during the month of June, July and August. During the balance of the year the thermometer ranges from 70 to as low as 32°, very seldom, however, falling below the freezing point. The mean annual precipitation is estimated at six inches, but no rain gauge has ever been kept verifying this fact until recently.

Precipitation.

At Mojave Station for six months ending Dec. 15, 1889, rain gauge kept by C. H. Fairchild, agent, shows the annexed figures, the "season" commencing July 1st and ending June 30th following:

1889.	Inches.
July	.00
August 31	.81
September 2	.15
19	.12
October 8	.04
20	.50
21	.68
22	.50
23	1.03
24	.36
November 18	.15
29	.10
30	.20
December 1	.80
2	.50
7	.30
12	.95
13	.80
14	.10
15	1.00
Total	6.52
Dec. 15, 1889 to June 30, 1890	5.95
Total for season	12.47

Mills.

Within the confines of the desert region there are in operation 16 stamp-mills dropping 187 stamps; the cost of these has been about $600,000. The silver bullion annually shipped from Daggett, owing in a measure to the low price of silver, has not been as great for the past two years as formerly, but it is estimated that notwithstanding the depreciation, that the Calico mines together with the bullion returns from Ivanpah, and other localities for the year 1889 amounted in the aggregate to $900 000 in addition. Gold, silver, copper and lead ores that were shipped to Kingman, Denver, and San Francisco equaled $200,000, and that to other points for reduction, $50,000, making a total of $1 150,000. The product of the county of borax, building stone, marble, onyx, lime and bitumen equals $200,000, so the total annual product is $1,350,000.

The City of San Bernardino.

The city of San Bernardino has but recently been incorporated, and, as the county seat of San Bernardino county, is located near the central portion of one of the most beautiful and fertile valleys in our State. The city lies in close proximity to the mountain range of the same name, whose lofty, snow-clad peaks (Grayback and Old Baldy) rear their heads to an elevation of 11,600 feet above the level of the sea. The city proper covers an area of two miles square, and has an elevation of 1075 feet above the level of the sea. It contains an estimated population of 10,000, which, within the past few years, has rapidly increased. Though one of the oldest towns in the State (having been settled by the Josephite Mormons, in the year 1849 and 1850), it is only of late years that it has thrown off its antiquated garb and come to the front as a modern and model city. It shows now all the evidences of prosperity; substantial blocks of buildings of modern architecture, built of marble, granite, stone and brick; first-class hotels with all modern improvements, elevators, electric lights and diamond-bedecked clerks; private residences, surrounded by shrubbery, lawns and ever-blooming flowers; are evidences of refinement and culture. There are four banks in the city with a combined paid-up capital of $718 000. There are two live daily newspapers, and 46 business buildings were erected during the past year, at a cost of $552,300, and 190 residences at a cost of $299,500. A sewer system, with over nine miles of pipe, is now completed. Three miles of artificial stone sidewalk, were laid, and the city otherwise beautified at a cost of $153,000. It contains 7½ miles of street railway, and 16 standard-gauge passenger trains depart from, and as many more arrive at the city daily. Three motor roads enter the city from different directions from the valley lands. Twenty-three trains of human freight reach the heart of the city daily, making it a railroad center and a receiving and distributing point for the surrounding country, particularly from that immense region lying northerly to the Nevada State line, and east to the Colorado river. The climate is unexceptional. Artesian and flowing water abounds, rendering the city a desirable dwelling place. The total assessment roll last year was $4,070 300, with prospects of a heavy and rapid increase the coming year.

Riverside.

Riverside, the garden spot of the county, was founded in 1870. Since that date its population has rapidly increased and now numbers in excess of 10,000 souls. The soil is strictly agricultural in character, though in the immediate vicinity of a mineral district which in the near future will, from the product of its mines, sustain a large and thriving population. I refer to the tin mines of Temescal, on the San Jacinto estate—Rancho de Sobrante — from which Riverside derived its title. On this estate, aside from the tin lodes, there are promising veins of gold, silver and copper of great strength returning high assay values.

The Pinacate gold mining district, geologically in the same porphyritic formation that surrounds the Temescal tin, contains both gold and silver bearing veins undeveloped, owing in a measure to the blighting effects of the litigation that surrounded the title to the whole of the San Jacinto estate. This being now removed, work of development will soon be resumed.

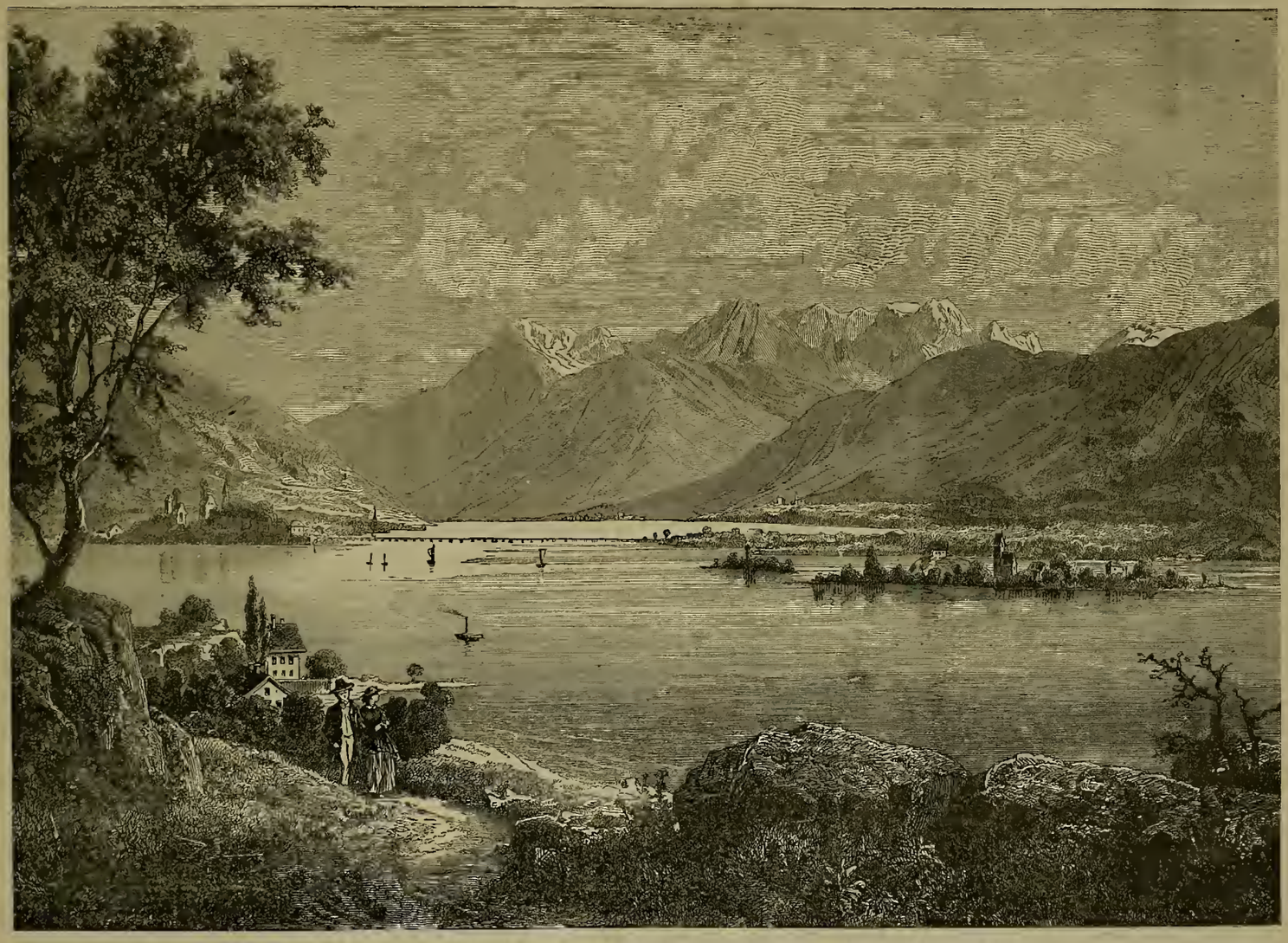
Riverside is famous for its semi-tropical fruits and its vegetables, the soil and clime being especially adapted to their culture. The dryness of the atmosphere insures their maturity to perfection, rendering Riverside the garden spot of the county and the home of the fruits of the semi-tropical clime. There the orange takes precedence as a product. It is celebrated both at home and abroad for its size, delicious flavor and sweetness. The yield of this fruit for the year 1889 amounted in value to $1,000,000. The next in importance is the grape, as the raisins can be cured to perfection in this favored clime. The raisins from this locality are pronounced by competent judges equal to the celebrated imported Malaga. The last year's product of the vine returned a figure in excess of one-half million dollars. But this is not all. Riverside produces peaches and apricots of a delicious flavor, vegetables, grain, hay, etc.

The business portion of the town is modern in construction. The town and suburban residences are models of beauty and denote a high state of prosperity. Railroad connection with the Southern Pacific at Colton by a motor, and the Santa Fe has extended its line to this place. Artesian wells furnish an abundant supply of water for domestic and irrigation purposes.

Redlands.

This place is situated at an elevation of 2000 feet above the level of the sea. It is the third city in importance in San Bernardino county, with a population of 2500. Situated ten miles from the capital and on the line of two transcontinental railroads, it is a baby in age, having been baptized and christened in 1887, but it is a giant in growth, containing over 30 brick business blocks, from two to three stories in hight, with many beautiful residences, opera house, city hall, etc. The fathers of the town were Messrs. E. G. Judson and F. E. Brown, the latter being the originator and projector of the great Bear Valley dam, a masterpiece of engineering skill and workmanship which has already added so largely to the prosperity of the county.

(*To be Continued.*)



VIEW OF THE SOUTHERN END OF LAKE ZURICH, WITH THE ALPS IN THE DISTANCE.

A Scene on Lake Zurich.

To give our readers a little change from contemplation of Pacific Coast scenery, we present this week an engraving of one of the most beautiful scenes in Europe, a part of the Lake of Zurich and its surrounding mountains. The Lake of Zurich, lying in the northeastern part of Switzerland, is celebrated for its picturesque beauty and its historical interest. The lake is 23 miles long and 2½ miles broad, and it extends from the city of Zurich in a southeasterly direction, nearly filling the valley to the hills on either side, which are the foothills of the Alps. The shores nearly its whole distance on both sides are sprinkled with the finest villa dwellings, owned by people of all nations. The engraving on this page represents the southern part of the lake, with its beautiful islands and shores, and shows the Alps in the distance. On the island upon the right are graves of some of the leading men of the Reformation, for here they took refuge from persecution.

RAILROAD ACCIDENTS.—A Cincinnati man, who has preserved a record of 320 railroad accidents, happening in this country in the past year, finds that only 13 out of the lot occurred from causes beyond human control. The others was due to drunkenness or carelessness.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—Cor. Amador *Ledger*, July 12: The work of cleaning out the sump of the Wildman mine is completed, and everything will be in readiness for sinking as soon as the pump can be lowered and placed in position. Mr. Higgins, the newly installed foreman, proposes to demonstrate that the entire mill can be run during the sinking operations. The hoisting engine of the old Rose mine is on the ground, and is being put in working order as fast as possible. They expect to strike water in a few days, and will have the hoisting gear ready by that time. The last building on the old Amador Consolidated ground is being taken down.

SUTTER CREEK.—Everything about the Wildman is booming. Supt. Tregloan is making preparations for another sinking of 100 feet, and expects to commence sinking in about a couple of weeks. Experience has taught him the necessity of having the sinking operations keep pace with other developments, and with the Wildman the outlook has steadily improved with increasing depth. A slight rupture occurred at the mine this week. Sam Smitherum, who has been foreman since the reopening of the property, retired from the foremanship. Mr. Tregloan has appointed Sidney Higgins to fill the vacancy. The new foreman is a man of much experience in mining and milling. On Mr. Smitherum's departure for the city, the miners presented him with a gold-headed cane, and he received a serenade by the band. Work has commenced in earnest at the Rose mine. Already four sets of timbers have been put in. The size of the shaft is about 8x4 feet in the clear. Mr. Poundstone expects material to arrive last enough for all requirements. Grading is in progress for the foundations for an engine and hoisting works, which will be pushed to completion as soon as possible. The Lincoln is running along smoothly. The rock that is sent to the mill is said to be of good quality, and indications are favorable for a long run.

Calaveras.

CHLORINE WORKS.—*Prospect*, July 12: Preparations are being made for enlarging the chlorine works at Angels. They will be enlarged to twice their present capacity. A large kiln of brick is in preparation, and will shortly be burnt for the work.

STARTING UP.—The old Bechtel mine at Angels is about to be started again by the Utica Mining Co.—Messrs. Hayward & Hobart. They propose sinking 200 feet farther. It is down nearly 400 feet. John Grange has the contract for the work.

RESIGNATION.—Mr. J. A. Ferson, superintendent of the Union mine at Copperopolis, has resigned his position and will proceed to San Francisco. Mr. Ferson has conducted the affairs of the mine in an able manner, and the company will lose an excellent manager in this gentleman.

El Dorado.

PROSPECTING.—*Mountain Democrat*, July 12: G. A. Richardson and G. W. Kimble have gone to Mount Aukum to rest and to prospect, we hear. Kimble and Charlie Winchell prospected the entire western portion of the county some time ago, and now Kimble and Richardson will prospect the southern portion of the county.

CREVICE.—On Thursday last, while Thos. Evans was at the Stewart claim near Webber creek and sitting down talking about the claim, he noticed a speck of gold in a crevice in the bedrock by his feet. Taking out his knife, he picked the piece out and noticed another piece behind it. He then scraped out a couple of handfuls of dirt from the crevice, which he panned out, and was surprised to find he had between eight and ten dollars in coarse gold, some nuggets being worth from one to two dollars. He unearthed a rich crevice for the owner of the claim, who will at once work the new find. The locality abounds in rich crevices, and a large amount of gold has been taken from them in days gone by, one pocket alone having yielded $1100.

SINKING.—Since taking the water out of the McNulty shaft, Supt. Raw has been sinking on the new shaft that is to be dug in the mine and getting ready for the contract work. The contract has been let on the shaft, and work will now be pushed forward rapidly.

Inyo.

RICH ORE.—*Index*, July 9: We are indebted to Malone & Fuller for a very rich specimen of gold ore from their Yellow Gnat mine at Fish Springs. The vein is small, varying from 4 to 12 inches. They have several tons on the dump and will soon make a run.

CERRO GORDO.—Inyo *Independent*, July 11: The Dunpby-O'Keefe mine at Cerro Gordo is reported to be opening out very well. A large ore body is in sight and shipments are made regularly. A few small veins of ore are reported in the Union mine but no large body yet in sight. The ground looks well as prospecting advances.

Nevada.

MANHATTAN MINE.—Grass Valley *Union*, July 12: The work of improving the road to the Manbattan mine in order to get in material and machinery is practically completed, and work has been started preparatory to the erection of a building over the shaft. It was the intention to open the old drain tunnel, but it has been found so badly caved that it would be cheaper to construct a new one, and for that reason it has been determined for the present to pump all water to the service, which can be easily done with the machinery that will be put up, as there is not a heavy flow of water in the mine.

MANHATTAN MINE.—Grass Valley *Union*, July 2: The Manhattan mine, on Gold Flat, Nevada district, is to start up immediately, the negotiations for a bond on the property, which have been conducted by M. L. Elliott, having been satisfactorily concluded. Mr. Elliott will have charge of the operations of the mine, and will commence work on Saturday. Arrangements have been made for all necessary machinery and pipe secured for the pipeline which is to be laid down to convey water-power. The water supply will be obtained from the South Yuba Co., and the line of pipe will be 1100 feet in length. It is expected that the machinery will all be in place and ready to operate in three weeks, when the shaft will be pumped out and necessary repairs made, after which sinking and drifting will be commenced. The Manhattan is in the slate formation, similar to that of the Grass Valley district, which is regarded as an important factor in favor of successful development.

Placer.

LAST CHANCE MINES.—Placer *Herald*, July 12: Last Chance, owing to its remoteness, attracts but little attention from the mining world, and yet it contains some very good and steady paying properties. The El Dorado mine at the Chance is reported as paying $70 a day to the man, and the Bishop mine is doing nearly or quite as well. The Golden Rifle is thought to be a better mine, even, than either of the above, but the tunnel which has been run into the channel proved to be too high, and another tunnel will have to be run before it can be profitably worked. The Caledonia, owned by David John, Aaron Anson and George Williamson, and worked by them, is yielding good pay at present from a bar outside of the channel.

ELKHORN.—At Deadwood the Elkhorn mine, the Davis mine and the mine of Gould & Dixon are all running, and while none of them are very large enterprises, we are informed that they are all doing pretty well in a modest way.

Plumas.

THE SAVERCOOL MINE.—Greenville *Bulletin*, July 4: On the Fourth, John Taylor, who has a contract at the Savercool mine, showed us a fine specimen of ore taken from a ledge recently developed. The ledge is between six and seven feet wide and is of high grade. The force of miners are drifting ahead. It is the intention of the owners to fit up the mill and start it.

San Diego.

THE HIGH PEAK.—Julian *Sentinel*, July 11: Some months ago C. W. Frost, of Santa Rosa, and A. J. Burnett, of Julian, bonded the High Peak mine, and quietly went about developing it. It had been worked some in the early days with the average success attending developments in all new camps. A few rich pockets on the surface were coyoted out and the claim abandoned to look after other interests. Mr. Burnett being an experienced mining man, he liked the outlook and work was accordingly commenced in an old tunnel that had been run in—long ago. We visited the mine Tuesday and found the upper tunnel in a distance of 125 feet, and followed the ledge, which is well defined and 5½ feet feet in width. On the dump are between 50 and 75 tons of ore that will probably average $20 per ton. We learn that two men can break and place on the dump ten tons of ore in ten hours. The rock is easy to break and but little waste has to be handled. In the lower tunnel that is being run to tap the ledge at a depth of 300 feet the boys are now in some 300 feet and expect to run another 100 feet before the main ledge is reached, although another ledge will be cut in a few feet. A new mill is talked of, and from present indications it will be needed.

Shasta.

A BIG NUGGET.—Redding *Free Press*, July 12: C. H. Behrens of Shasta was in town this week and exhibited one of the finest nuggets of gold it has ever been our pleasure to see. The specimen weighed $312, and was purchased by Mr. Behrens from Cunningham & Drummond, who struck the rich pocket on Rock creek, about 1½ miles from Shasta. With the exception of an ounce of quartz it was a solid chunk of wire twist. The men who struck the pocket from which this nugget was taken have extracted over $3000 and are still at work.

MINING NOTES.—The prospect struck by Bob Small a few miles north of Whiskytown is looking remarkably well. A sale of the claim adjoining the Banghart mine on Mad Mule is now being negotiated. It is likely that Fleming & Bauder will purchase the claim which is owned by Jim Blair and others. According to our northern exchanges the mines on Castle creek are attracting more and more attention. Fleming & Bauder have purchased the Bangbart mine near Whiskytown for $3000, and expect to place a force of men to work in the near future. They seem to be a general air of prosperity prevailing at present all over northern California, especially in the mining business. As we go to press a large sale is in progress of an Old Diggings property. The Niagara has struck a fine body of ore. The Gladstone has stringers of $1000 ore putting into the main ledge in the east drift. The Brown Bear of Deadwood keeps putting out its steady stream of dividends. Myriads of lesser properties in this section of the country are developing good ore bodies, some of which will at some time jump into prominence. Mining middlemen are busy hereabouts securing properties by bond and working interests, but all complain of prices being too high. If they would not play for too high commissions in making sales, a great deal more of capital would find its way into this region. Many disappointments have occurred for want of proper processes of working the ores in this section, and in trying to work base and refractory ores by free milling process. Certain capitalists are now taking advantage of these mistakes, knowing, of course, the free milling part of a mine is limited, and also that all of the great mines of the West have been base and refractory ores. The Ball mine, situated on the opposite side of the mountain from the Black Bear, has $20,000 worth of specimens at the mint, and has shipped $40,000 of tellurium to San Francisco. Eureka and Humboldt capitalists are investing largely in this region, both in quartz and gravel mines. Parties here from Salmon river say the placers are doing fine. Schuner & Co. have taken out $60,000 or $70,000 this spring with 12 men.

THE MINING OUTLOOK.—Redding *Free Press*, July 12: In a conversation with W. H. Fowler, the mining expert who is associated with ex-Governor Perkins and others in an extensive gravel claim in Trinity county, he stated that, in his opinion, Shasta, Trinity and Siskiyou counties have the best mining future before them of any counties in the State. The reason for making such a statement certainly seems conclusive. Compared with other mineral districts, these three counties are yet wild, unexplored and undeveloped. Perhaps what will yet prove the richest mining properties are still undiscovered. The quartz abounding in the three counties named yields a higher per cent per ton than anywhere else in the State, and the Mint receipts will show it. There are mines in this State working quartz yielding from $3 to $7 per ton, and are making it pay. A lead of that character in these three counties, yielding no larger results per ton, would never be developed. The main trouble is, said Mr. Fowler, that the business men of the county have not sufficient confidence in the mines. They lack the courage or the enterprise to encourage the prospectors and the miners. Many a good prospect has been abandoned through lack of a small "grub stake." However, notwithstanding this state of affairs, there are a great number of new mines being developed, and we see mine-owners around us getting rich. Capital is gradually creeping in, and even now some of our best properties are in the hands of foreign capitalists.

BUNKER HILL.—*Courier*, July 12: Parties interested in the extension of the Original Bunker Hill mine, at the mouth of Middle creek, had surveys of their ground made this week. We understand that some of the claims on that once noted and rich-paying mining property will soon be worked again. By the death of some of the principal owners, nearly all claims in the group have lain idle for 20 years; but it is the intention of the heirs to have more work done.

Sierra.

MOUNTAIN MINE.—Sierra *Tribune*, July 12: Contractor George M. Pinney, assisted by Supt. R. B. Harper, is making things hum at the Mountain mine. "That mill must be ready to drop by October 1st," says Contractor Pinney. The wagon-road is being pushed along by contractors Flint and Haggerty, and that together with the flume and ditch is likely to be completed in a couple of weeks. The boarding-house at the mill site was opened several days ago. The superintendent's house is well under way and a short time will suffice to complete it. The mill work is in charge of an experienced hand and everything about the building of that is going like clock work. The tramway man will soon arrive here from New Jersey and begin his work.

MILL RUNNING STEADILY.—At the Garabaldi mine in Gold Valley the mill started up on the 6th instant and is pounding away day and night. It was found necessary to run a tunnel 60 feet through snow on the outside track. At the Young America mill $17,700 was cleaned up as a result of the June run.

Siskiyou.

SCOTT RIVER.—Yreka *Journal*, July 7: The mines in Scott River canyon have shown very rich prospects, and arrangements will soon be made to open them in systematic manner. Pitts and McCarty, who have been prospecting lately without opening their claim to any great extent, brought 20 ounces of gold to Scott River last week, and expect to develop one of the richest bonanzas ever discovered in Siskiyou. The gold is found in a mass of decomposed quartz and gravelly soil, which can be worked like placer mining, but as the owners sink down the claim will probably develop a well-defined quartz ledge. Other parties also have claims in the same locality, which they intend opening during the summer.

CASTLE CREEK.—The Dunsmuir *News* says: Mat Young came down from the mines on Castle creek, bringing a number of rich specimens from his and Mr. Branstetter's claim, which shows up better than anything we have seen come from there before. They have been sinking on the ledge and find it increasing in width and richness as they go down. It is acknowledged now by all who have been up there that these mines are an important discovery. Mr. John Cody also brought down some specimens from a claim owned by him and Mr. Isgrigg, which panned out well in gold.

THE HYDRAULIC mine at Summerville, in the Salmon river district, is turning out exceedingly good this season, with abundant water to keep the giants in operation until September. The hydraulic mines of R. H. Campbell at Quartz Valley, and of the Eastlick Brothers and Wright & Co. at Oro Fino, are all paying handsomely with sufficient water to run the giants until August, being the longest season ever known in the county for working these rich paying and extensive claims.

NEVADA.

Highland District.

NEW OWNERS.—Pioche *Record*, July 7: Several prospects in Highland district have recently changed hands, and the new owners intend to begin work at once. The approaching railroad is the direct cause. The claims of Highland district usually produce ore of too low a grade to bear the expense of shipment to Salt Lake, though the ledges are large and ore abundant. The district was a very prominent one in the early '70's, and will again become so when cheap transportation is afforded.

Washbe District.

SIERRA NEVADA.—Virginia *Chronicle*, July 12: On the 630 level the west crosscut from the southwest drift, 600 feet from the shaft station, is advanced 420 feet, through a clay wall and onward to the west wall, passing through 12 feet of quartz showing low assay value.

UNION CON.—On the 1465 level from the north lateral drift, opposite west crosscut No. 4, east crosscut No. 1 is advanced 564 feet. Continuing in porphyry and clay carrying some water.

MEXICAN.—On the 1465 level, at a point 70 feet south from west crosscut No. 4, west crosscut No. 5 is advanced 229 feet, continuing in porpbyry showing some quartz.

OPHIR.—On the 1300 level the winze at a point 66 feet southwest of the raise is down 66 feet, continuing in low-grade quartz.

CON. CAL. & VIRGINIA.—The 1300 and 1500 levels continue to yield the usual quantity of ore. There has been extracted during the week from all parts of the mine 2767 tons of ore. Shipped to the Morgan mill 1107 tons and 1090 pounds of ore, and to the Eureka 1659 tons and 1280 pounds; battery sample assays showing an average value of $16.75 per ton; 2762 tons milled. Shipped bullion valued at $56,695.83 to the Carson mint.

BEST & BELCHER.—All work on the 1000 and 1200 levels for the past week has been confined to repairs.

SCORPION.—The southwest drift from the 660 level shaft station continues in clay and porphyry.

ANDES.—On the 420 level the north drift from west crosscut No. 2 is in 69 feet; formation quartz, clay and porphyry.

OCCIDENTAL CON.—Continue to extract ore of good quality from the stopes on the 400 and 450 levels. The crosscut from the bottom of the winze below the 550 level is in six feet, showing low-grade quartz.

SAVAGE.—Shipped 400 tons of ore, showing an average value of $22 50 by battery sample assays.

CHOLLAR.—Extracted 404 tons of ore, battery sample assays showing a value of $20.12 per ton.

POTOSI.—Sinking the winze below the 930 level suspended pending the excavation for a station on the 1030 level, preparatory to following the ore vein with lateral drifts.

ALPHA.—The 600 level southwest crosscut is in 51 feet, the face in quartz and clay.

EXCHEQUER.—The 600 level north lateral drift is out 385 feet; face in porphyry and quartz.

CON. NEW YORK.—The north drift from the top of the raise above the 800 level is out 293 feet, the face in porphyry.

IMPERIAL.—The joint Confidence-Challenge 1000 level west crosscut No. 2, is in 194 feet, the face in low-grade quartz. Joint north drift, same level, is in porphyry.

YELLOW JACKET.—Shipped 600 tons of ore showing average assay value of $22 by battery sample assays.

CROWN POINT.—Shipped during the week 625 tons of ore, showing an average value of $15.08 per ton by pulp assays.

CONFIDENCE AND CHALLENGE.—The joint Imperial 1000 level north drift from west crosscut No. 1 is out 135 feet, the face in low-grade quartz.

BELCHER.—The 850 level west crosscut is in 90 feet, quartz and clay showing in the face. Began extracting ore from the 300 level stope July 7.

SEG. BELCHER.—The raise above the 1000 level east crosscut No. 1 is up 162 feet, the top continuing in low-grade quartz.

JUSTICE.—During the week crusbed 167 tons of ore showing a value of $30.44 per ton by battery sample assays.

ALTA.—The ore output this week was 356 tons, showing an average assay value of $21.75 per ton by pulp assays.

OVERMAN.—Shipped 486 tons of ore during the week showing an average value of $22 per ton by battery sample assays.

Eureka District.

ORE SHIPMENTS.—*Sentinel*, July 12: During the week the Eureka and Palisade Railroad Co. shipped 383 tons of ore to the Salt Lake City smelting companies.

PURCHASED ORES.—During the month of June the following shipments of ore were made to the Eureka Con. reduction works for treatment from the mines of the district: From the Lord Byron mine, 109½ tons; Dunderberg, 65¾ tons; Kentuck, 2¾ tons; Ethel, 7 tons; Morning Star 2 tons and Evans 1. From Reveille 10 tons and Mineral Hill 2¾ tons.

Jackrabbit District.

LOW-GRADE ORES.—The low-grade ore bodies opened by the P. C. Co. in the Day mine, and which induced the purchase of the property, continue to improve, and the quantity is simply immense. The same ore showing made by previous owners, and under the disadvantages to which they were subject, would have created but little, if any, comment, as the ore is of too low a grade to justify mining and working alone. Now, however, it is mined and used at the furnace here mainly as a flux and justifies extraction for that purpose. The present proposed terminus of the Pioche branch of the coming railroad will be in the valley some 10 or 12 miles from the mine, all down hill, and the road continued that distance up the valley on the line as now surveyed would bring it within two miles of the property. It is not unlikely that this will occur, Mr. S. V. White having expressed himself to that effect when here recently. In that event, the Day mine with the present showing, though now valuable, would easily become worth a quarter of a million.

ARIZONA

ACTIVE.—Prescott *Journal-Miner*, July 12: At no time in the past ten years has there been so much activity and legimate work in the mining districts which surround Prescott as can be noticed this year. If the number of mills now running, and the vast amount of money being expended in developing new and old claims, goes for anything, it shows, to say the least, an increased confidence in the worth of our mines, and that a new era has dawned upon this section. In nearly every district to the south of us will be found from four to a dozen claims in each of which as many miners are at work sacking ore for shipment, or else placing their properties in shape to yield. Stephen L. Mott is here, and with him came Johnson's pack train with 12,000 pounds of ore for the sampler. This last shipment will yield Mr. Mott at least $500 per ton, according to the judgment of experts. The main shaft on the Prince is down to a depth of 180 feet, with some drifting and stoping being done. Mr. Mott has purchased the Tuscumbia mill, and expects to have it in operation by the first of August on ore from several mines in the Peck district in which he is interested. Frank Kuhne has a force of men on the Belle mine, in Walker district, taking out good shipping ore. At present he has sacked, on the dump, ready for shipment to the sampler here, 60 tons, the first lot of 5000 pounds being brought in a few days ago by Joe Roberts. Seven tons of ore from the Amulet mine were received at the sampler on last Tuesday. This property is at present being worked under a lease, and is holding up remarkably well in the size and richness of the vein. The Dixie mill, on Lynx creek, is at present idle from lack of water, but a force of miners are at work in the company's mines extracting ore. A sale is reported of the Bullwhacker mine, four miles east of town, from J. R. Slack to Bashford & Burmister, for $3000. The Del Pasco mill is running night and day on ore from the Old Reliable. It is free gold and yields $25 per ton. Hon. W. A. Rowe is pushing work on his W. A. R. mine, near the Peck. He has one of the largest veins on the mountain and a good mine, from which he expects soon to ship ore. Shekels & Place are running their mill regularly on Crowned King ore, which is concentrated and shipped East. Pack trains are among the necessities miners are calling for at present. Those now in use have work for months ahead. O'Neill and Martin, of the Maggie mine on Turkey creek, have a carload of ore sacked and ready for shipment to Socorro, N. M. The Kansas City Co. have a force of 12

men working the Silver King mine, on Groom creek, outside of the disputed line of "agricultural" land. We hear they have struck good ground, the ore in character and richness being similar to that of the original vein. The Buena Vista mine, in Crook canyon, on which a couple of unique-looking arastras have been grinding out gold for the past two years, has been sold for $20,000. W. T. Hall is running through a lot of 30 tons of tailings from the Oxford mine on Groom creek, which yields $20 to the ton. A party of eight miners are prospecting in the Groom creek side of the Lynx creek mountains, and also doing some work on the old Parker mine in the same locality, which shows up well as work progresses. Frank Butler came in Tuesday with 7000 pounds of concentrates from the Crowned King mine, in Bradshaw district. The Lynx Creek Hydraulic Co. are at present surveying and looking over the ground on which the dam is to be built.

EUREKA DISTRICT.—Prescott *Courier*, July 3: John Lawler has gone to Eureka district, where about 50 men are at work in the Hillside silver mines, Eureka copper and others. Teams are constantly arriving from the Congress, with sulphurets. "Steve" Mott, the coming bonanza miner of Peck district, is working the Prince mine, pumping water out of the Black Warrior and getting the Tuscumbia mill in good running order. Twenty or 30 such men as Steve would make work for 1000 others and give us a much larger bullion product. There are men who honestly believe that the Crowned King mine, of Bradshaw district, is the best gold mine in the country. Mr. John White states that Yarnell & Co.'s big mine, near People's Valley, is the pride of that section of the country.

UNITED VERDE MINES, which were at one time considered of little value, are at present worth more money than some of our Arizona counties. They are worked by a miner, Hon. W. A. Clark, of Butte, Montana, and he knows a mine and how to work it.

HASSAYAMPA. — Mr. O. W. Stuht, just from Hassayampa district, tells us that himself and partners recently found an old mine which they have named the Aztec; that the ore mills between $20 and $25, gold; concentrates carry $10 more in gold, $30 in silver and about 5 per cent lead to the ton. They have cleared out part of the old cut, in which they found stone hammers and other tools; also charcoal. The cut, they think, is quite long. They work the ore in a 2-stamp mill. As this ancient mine is but about 12 miles south of Prescott, several people talk of going to it and seeing with 19th century eyes how pre-historic miners dug the precious ore. Geo. B. Ridenour is blasting 300-ounce silver ore out of his Delta mine.

BRITISH COLUMBIA.

TOAD MOUNTAIN.—Nelson *Miner*, July 11: The claims on 49 creek, about 8 miles southwest of Nelson, are looking good and improving as work progresses. Many of them are, as yet, mere prospects, but their owners have faith in the country, and know that there is always a ready market for free-milling gold properties such as they believe they have. Assessment and development work has been begun on many of the claims between the Silver King and the Toughnut, a distance of over 3 miles. At the Poorman, the 10-stamp mill is running during the day with satisfactory results, and ore hauling has been resumed. Twelve to 14 men are at work in the mine. Several claims on Anderson and Sucker creeks have been bonded or sold to parties who are handling outside money. The nickel claims on the north side of the river are attracting considerable attention, and are believed to be rich in ore, carrying that ductile metal.

COLORADO.

SALE.—Georgetown *Courier*, July 10: The Alexander lode, situated on Keith mountain, one mile up Mill creek from Dumont, was sold last week for the handsome sum of $80,000 to eastern parties, who have organized into a company known as the Alexander M. & M. Co. This sale is only a forerunner of a number of others which are to follow soon.

ORE.—During the month of June there was shipped from the Georgetown depot 61 cars containing 879 tons of ore, valued at $90,000; 23 cars went to Argo and 38 cars to Denver.

STRIKE.—A good strike has been made in the Luella mine over at William Forks. The vein of ore ranges in thickness from 12 inches to two feet, while it is not all solid, yet it is all pay. It mills 375 ounces silver and from 2 to 3 ounces gold to the ton. This ore body is continuous for 100 feet as far as yet known.

PIONEER.—Drifting and stoping is progressing on the lower level of the Pioneer, in which workings there is exposed about two feet of material, seven inches of which mills 6 6-10 ounces gold and $12 in silver to the ton. The remainder returns, under stamps, from 3 to 4 ounces gold to the cord.

THE MONTE CRISTO.—Aspen *Times*, July 12: Since the recent strike was made in the Monte Cristo, the company has been pushing work on the property most vigorously. The developments have been entirely satisfactory, but the ore has not yet come in in large quantities. The grade of the mineral that is found is very good and the shipments that are being made are more than enough to pay expenses.

THE EDISON.—The lessees of the Edison are driving work on the property and continue to find large bodies of very good ore. The regular rate of production that has characterized the mine for two months past is maintained and the grade of the mineral keeps up to 60 or 70 ounces.

LOWER CALIFORNIA.

FROM ALAMO.—*Lower Californian*, July 10: The El Paso Co.'s mill run through a lot of ore from the Scorpion mine, owned by McGrath and Joseph, last week which yielded 55 ounces of gold. The Princesa Co. melted $6000 into two bricks, which was the result of a long, uninterrupted run on ore from the San David, Princesa and Telémaco. These three are the company's producers at present. Hoisting works are in operation on the Telémaco, and Engineer Wright says they work to perfection. Mr. Poole is at present the foreman of the Telémaco. Wm. Lawry is foreman of the Princesa. Everybody is awaiting the arrival of the Princesa Co.'s big 10,000-pound boiler and heavy pumps. The Indian mine will then be put in operation, among others. The Santa Clara Co. is working steadily on the Encantada. Laoe's mill is kept busy as usual on custom ore. Kerr's mill is running again, making the fifth mill in actual operation.

CUCAPA.—F. B. de la Paht expects to hear almost any day of new and important discoveries in the Cucapa mining district, of which he is part owner. It is an immensely rich district in a variety of minerals, and with the 25 men now prospecting there, it will be strange if Mr. Piña's expectations are not realized.

GOLD.—Three new ledges of gold quartz were discovered during the past week by C. Castillo and Adolfo Bareño, about 100 yards inside of the old works of the El Pueblo mine, two miles northeast of the Real del Castillo.

MONTANA.

HELENA MINES LOOKING UP.—Montana *Mining Review*, July 12.—A few weeks since we mentioned the developments at Three-Mile, on the Branch to Marysville. On Monday last the first ore-car made its appearance on the spur at that camp, and after being filled with ore, reached Helena on its way to Omaha, last evening. This 20 tons came out of a 50-foot shaft and a 60-foot tunnel, without stoping or drifting. The president of the company, Mr. Wm. H. Morrell, who has been in Helena some weeks looking after his mines in person, returns East soon to procure machinery, etc., for the thorough development of the Three-Mile Group. Some of the ore assays high.

CASTLE DISTRICT.—Up to the present time only a small force has been at work on the Hidden Treasure, Castle district, simply prospecting the old works. Having satisfied themselves on this matter, a site for a working shaft has been located, and as soon as timber can be had a large force of men will be put to work. It is the design of the management to push the prospecting, both on the surface and underground, and sink the main shaft at the same time and employ at least 14 men steadily.

THE GRANITE'S OUTPUT. — Helena *Mining Journal*, July 12: The output of the Granite Mountain for the week ending July 3d was 52 bars of bullion, containing 76,576 ounces fine silver and 179 ounces fine gold. The silver product of the mine averages about 70,000 ounces per week. Roughly estimated, the value of this output at the prevalent price, $1.04, is $76,960, while at 92 cents, the late ruling price, the total of the same output would not exceed $71,080.

DRUM LUMMON.—*New Northwest*, July 12: The output of the Drum Lummon mine for the month of June was: Number of tons of ore crushed, 7067; total yield, $94,400; working expenses, $56,300. The Deer Lodge Mining & Reduction Co., a few days ago, shipped a half carload of ore taken from the levels and running 50 ozs. silver and 54 per cent lead.

NEW MEXICO.

HANOVER.—Silver City *Enterprise*, July 12: One of the most perfect successes attendant upon the inception, completion and operation of a mill or smelting establishment it has ever been the pleasure of the *Enterprise* to chronicle, is that of the Neff smelter on the Anson S. mine near the head of Hanover Gulch. The enterprise was a private one. The furnace is 30 tons capacity, and rated as one of Frazer & Chalmers' best water jackets. The copper product in ingots, is the finest that has ever been made in the country, and selected bars may be rated in commercial parlance as "wire copper" on account of its purity.

LONE MOUNTAIN.—The estimated output of the Good Luck mine since its location a little more than six weeks since, is over $8000. Eight hundred sacks are now ready for shipment. The Louise, the property of E. M. Young, at a depth of 13 feet is showing well. Elsewhere throughout the district there is considerable work going on and the annual product for this year, 1890, will exceed that of 1889 by $50,000, making in round numbers an output of $75,000.

PINOS ALTOS.—A contract of 150 feet has been let, for the sinking of a double compartment shaft on the Mammoth, one of the oldest locations in camp. This will open up immense bodies of ore, and furnish in connection with other properties an ample supply for the mill soon to be erected.

OREGON.

RICH STRIKE.—Baker City *Democrat*, July 7: The *Democrat* learns from what is deemed reliable authority that a rich strike has been made in the Monumental mine at Granite, operated and owned by the Eastern Oregon Gold and Silver Mining Co., Limited, of London, England. Our informant, who is a mining man, says that the vein is fully 18 inches wide and the ore will run from 500 to 1000 ounces to the ton. This is certainly welcome news, as no company operating in this section deserves success more than the company above named.

A BRIGHT OUTLOOK.—Mr. Geo. Robinson of Detroit, president of the Detroit Mining Co., operating the Lower Powder placers, spent several days in the city last week. The gentleman expressed himself as being highly pleased with the mining outlook of Baker county.

UTAH.

AT OPHIR.—Salt Lake *Mining Review*, July 9: The old Sparrow Hawk and Carrie Steele mines, six miles south of Ophir, are reported to be in the hands of new men, who have started to working them. These properties, years ago, had a stamp mill in operation and produced considerable bullion, but have been idle for a long time. New men and capital promise to make producers of them again at an early date. This locality is known as Lewiston in mining circles.

CRESCENT.—Salt Lake *Stock Exchange Journal*, July 11: Work on the Crescent, at Park City, is progressing famously. Mr. J. McGregor informs us that the concentrator is working to better advantage than ever before, and that the season's run would be a very prosperous one. The mine now employs 80 men. The product of the Crescent last month was $20,000. This mine has paid $228,000 in dividends and never made an assessment.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 8, 1890.

431,550.—BROILER—Wm. Brooks, Oakland, Cal.

431,872.—HEADLIGHT FOR LOCOMOTIVES—W. J. Burke, Seattle, Wash.

431,554.—CAR TRUCK—C. C. Butterbaugh, Los Angeles, Cal.

431,717.—HORSE FOOT PAD—F. M. Dreibelbis, Los Angeles, Cal.

431,662.—COMBINATION TOOL—F. Kortick, S. F.

431 607.—PULP DISTRIBUTOR—F. E. Monteverde, S. F.

431,708.—DAMPER—S. S. Richardson, Happy Camp, Cal.

431,676.—OPERATING ELEVATOR HATCHWAY GATES—C. P. Stanford, S. F.

431,788.—AXLE NUT—J. M. Thorp, Santa Rosa, Cal.

432,001.—HORSE COLLAR—T. J. Thorp, Flagstaff, Ariz. Ter.

432 002 —RUNNING GEAR FOR WAGON—T. J. Thorp, Flagstaff, Ariz. Ter.

431 680.—CABLE SHEAVE—F. B. West, S. F.

431,790.—AIR BRAKE—G. B. Williams, Portland, Oregon.

The following brief list by telegraph for July 15, will appear more complete on receipt of mail advices:

California—Henry Casebolt, San Francisco, excavating apparatus; George E. Crocker, Oakland, window-case hinge; William Davis, Los Angeles, cultivator; Willis S. Olletrap Pixley, washing machine; Robert C. Grimes, Santa Monica, attachment for lawn mower; Hiram B. Hanmore, Santa Cruz, covering for pipes; Alden D Kilhorn, Oakland, safety relief valve; John B Masters, Stockton, cotton harvester; Bartlett McIntyre, San Francisco, loading mechanism for wire rope transmission; Walter McQuille, Los Angeles, grass catching attachment for lawn mowers; Nathan W. Moody, Fresno city, fuse cap fastener; Orrin W. Parker, Oakland, wind-mill; Siggey D Smollianoff, San Francisco, assignor to the Americanite Manufacturing Company of Virginia, explosive compound; George A. Stom, Golden Gate, vehicle running gear; James Van Curen, Ferndale, sand-band.

Oregon—Alice M. Miller, Ashland, fruit boiler.

Washington—Joseph M. Clark, Colfax, double-acting pump.

Arizona—Louise J. Depuy, Phœnix, device for supplying gases and liquids to moving vehicles.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DAMPER.—Samuel S. Richardson, Happy Camp, Del Norte county. No. 431,708. Dated July 8, 1890. This is a damper for stove-pipes and similar flues and smoke-conduits. The object is to provide a simple and readily operated damper, which can be readily inscrted in place without materially weakening the stove-pipe, and which, when in position, can be expanded or contracted, so as to adjust it suitably to the interior area of the pipe.

COMBINATION TOOL.—Frank Kortick, S F. No. 431,662. Dated July 8, 1890. This is one of that class of tools or implements which are designed for a variety of purposes, and are commonly known as combination tools. The implement is mainly used as a nail puller for boxes, but can be used as a wire cutter, as a mark scraper and as a prier for the bands or boops of boxes.

DEVICE FOR OPERATING ELEVATOR HATCHWAY GATES.—Charles P. Stanford, S. F. No. 431,676. Dated July 8, 1890. This patent covers certain details of construction by which the rising elevator opens the gates or doors which close as the elevator cage passes and on the return or downward trip the doors also open automatically for the elevator to pass and again close when it has gone by. By the peculiar construction the movement of the hatches or gates is made positive, the opening and closing being controlled by the movement of the cage.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

PACIFIC NOVELTY CO., July 12. Capital Stock, $25 000. Directors — George T. Ulmer, W. H. Brown, Albert Howell and A. D. Lockwood.

CALIFORNIA PRESSED BRICK CO. July 16. Capital stock, $150,000, Directors—W. A. Vandercook, J. K. Luttrell, J. A. Waymire, F. F. Ryer and J. E. Carey.

LOW ADJUSTABLE CAR CO., July 16. Object, to manufacture a patent street car, which can be used either as an open or closed car. Capital stock, $1,000,000. Directors—A C. Hamilton, J. B. Low, A. K. Grim, John H. Boalt.

PYRAMID HARBOR PACKING CO., July 16. Object, to pack salmon and other fish. Capital stock, $100,000. Directors—J. E. Gordon, E. B. Beck, Irvin Ayres and E. P. Stone.

MECHANICS' INSITUTE FAIR.—Mr. Culver, the superintendent of the coming fair, reports favorable progress and applications for 42,500 feet of space. Bids for the various privileges have been received. The United Edison Manufacturing Co. has made an offer to light the building and provide numerous electrical novelties for certain stated prices. It is desired this year to make the art gallery exhibit superior to previous ones. The prospects are bright for one of the most successful exhibitions ever held here.

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$12,229	$.....
Alpha	14 528	.....
Andes	22,201	.....
Bodie Con	8,035	.....
Benton Con	88 250	.....
Belcher	..	12,5 5
Belle Isle	...	517
Best & Belcher	14 474	.....
Bulwer	0,381	.....
Bullion	15,462	.....
Challenge Con	69	.....
Caledonia	6 031	.....
Chollar	10,0 8	.....
Con. Cal. & Virginia	760 156	.....
Confidence	8,334	.....
Con. Imperial	...	14,989
Con. New York	12 842	.....
Commonwealth	.....	12,308
Crocker	.....	1,674
Crown Point	.....	19 325
Del Monte	...	4 899
East Sierra Nevada	3 923	.....
Eureka	43,000	.....
Ex hequer	3,014	.....
Gould & Curry	14, 38	.....
Grand Prize	..	21,409
Hale & Norcross	7 915	.....
Holmes	...	*1,637
Independence	1,016	.....
Julia	6,472	.....
Justice	13 225	.....
Kentuck	3,4 7	.....
Lady Washington	15,063	.....
Locomotive	1 0 9	.....
North Belle Isle	...	13 615
North Commonwealth	.....	6, 96
Mexican	18,992	.....
Mono	7,090	.....
Nay Jo	...	8,057
Nevada Queen	.....	15 696
Occidental	31,112	.....
Ophir	28,914	.....
Overman	44,584	.....
Peer	964	.....
Peerless	2 787	.....
Potosi	14,303	.....
Savage	.....	†1,720
Scorpion	4 623	.....
Seg. Belcher & Mides	12 364	.....
Silver Hill	10,184	.....
Sierra Nevada	42,6 2	.....
Silver King	.....	.....
Standard	.....	9 441
St Louis	830	.....
Syndicate	4,534	.....
Union Con	10 034	.....
Utah	6,692	.....
Welcon	92	.....

*More assessments to come in.

†Bullion not sold, $129,599, with other shipments to be heard from. Mine expenses for June to come out.

‡June bullion output and mine expenses not included.

Mining Share Market.

The mining share market has been decidedly mixed under spasmodic business. Con. Virginia and Ophir fluctuated downward, while the other Comstocks, outside of Potosi, Bullion and Gould & Curry, showed slight fluctuations with no material change in prices. Potosi made some lively moves without any marked gain in price. Bullion and Gould & Curry scored an advance. The market to an outsider looks very much as if the ring has stocks to sell but fear that the public will sell and not buy if a decided advance is made in prices. It looks as if the new silver law is being worked to help in unloading, as is the "pumping racket" at the south end. If these fail to draw in large buyers at higher prices, then, of course, something else must be resorted to, probably a new (?) development. They have heretofore played the development "racket" quite successfully, and will if need be do so again so as to sell out at higher prices, after which more assessments and the public sellers at a heavy loss. In outside stocks trading was only fair. Bodie floundered about like a fish out of water. In the Tuscaroras and Quijotoas there was very little trading.

In another part (editorial) of the paper is given the latest advices received from Comstock mines. At a special meeting of the Bullion Mining Co., the management was turned over to Hayward and Jones. At the Savage Co.'s election the old board was re-elected.

The control of Best & Belcher and that of Gould & Curry appears to have passed into other hands. It is to be hoped that if any milling ore should be found under the new management, that the mine and battery assays will be given, as well as other needed reforms be brought about. Until the ring is retired and the mines honestly worked, outside dealers will have no chance to make money, but instead they have a certainty of losing their all.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none out worthy men.

J. C. HOAG—San Francisco.
R. G. BAILEY—San Francisco.
SAMUEL CLIFF—San Luis Obispo Co.
C. J. WADE—San Bernardino Co.
W. W. TURNBALDS—Santa Barbara and Kern Cos.
E. B. TAFT—Central California.
JOHN B. HILL—San Diego Co.
E. H. SCHARPFLE—Calaveras Co.
FRANK S. CHAPIN—Solano and Lake Cos.
W. E. P. FROST—Alameda and Contra Costa Cos.
J. G. H. LAMPADIUS—Santa Cruz Co.
GEO. WILSON—Sacramento Co
H. KELLEY—Modoc and Lassen Cos.
WM. M. HILLYARD—Oregon
H. O. PARSONS—Northern California.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

MECHANICAL PROGRESS

A Novel Wrought-Iron Chimney.

The following, from *Industries*, are the particulars in regard to the mode of constnotion of a wrought-iron factory chimney of a somewhat novel description, which has been hnilt at Creusot. The total hight is 279 feet, the diameter 23 feet at the hase and 7 feet 6 inches at the top, the total weight being 80 tons, exclusive of masonry foundations. The latter are carried 3 feet 3 inches above the ground and weigh about 300 tons. The shaft was hnilt in successive rings, each 4 feet 1 inch high, the thickness varying from nine-sixteenths of an inch at the hase to one-fourth of an inch at the top. The nine lower rings were formed of 8 plates each, the upper ones of 4 plates each. The hase was encircled by a massive angle iron holted to the foundation. The 8 lower rings were lined with fire-brick. The erection of the chimney occupied 70 days, including taking down the flying scaffold. The latter was of a somewhat novel character. It consisted of a central wrought-iron tuhe 7 inches in dismeter, and provided at the hottom with 4 wooden crosshars or arms, so clamped that their length could he adjusted to suit the varying diameter of the chimney and carrying the internal platform. These arms rested on angle hrackets refitted to the interior of the plates The upper part of the central tuhe carried 4 cross-arms or jihs, each consisting of a pair of timhers stiffened hy raking strnts from the central tuhe. From their outer ends was slnng the exterior oircular platform.

The latter consisted of a pair of angle iron rings, to the outer part of which was riveted a plate iron fence, while the inner was provided with T-iron stanohions. Radial hearing timhers, resting on these rings, and adjnstahle endwise to snit the varying diameter of the chimney, carried the platform, an annular spsoe heing left just sufficient for hoisting the plates. The latter operation was effected hy a rope passing over an adjustahle pulley fixed to each jih in turn, and carried down a central tnhe to a snatch hlook fixed at the hottom of the chimney. As each succesaive ring was riveted np, two pairs of hars were laid across, hy whioh the scaffold was slung hy four jack-sorews furnished with ratchet oollars, and thus raised high enongh to take a hearing on the next set of angle hrackets. The oomplete scaffold weighed about 4 tons, and the heaviest plate about 8 hnndred weight. The total cost of the ohimney without foundations was about $8000.

A Chimney 460 Feet High.

Another chimney of most remarkahle character has been designed for the Royal Smelting Works of Saxony, Germany, hy Herr Heneicke, that is to he 460 feet high, with an inside diameter of 23 feet at the hase and 15 feet 6 inches at the outlet. The works will he connected with the chimney hy a horizontal flue 1093 yards in length, which crosses the River Mulda and takes an upward course of 197 feet to the top of the hill, where the giant ohimney will stand as an example of engineering skill. It will take 1,500,000 hricks to huild this perpendicular fnnnel, and its oost is estimated at ahout $30,000.

The Latest Theory on Boiler Explosions.

In a paper read hefore the Scientifi> Society of Bridgeport, Conn., Frank G. Fowler advanced the following theory on hoiler explosions: Many explosions take place when an engine is started—that is, when the throttle valve is opened and steam is drawn rapidly from the hoiler which had heen np to that time entirely olosed. Here the conditions approach thoae of the experiments—that is the hoiler still contains the air and other gases which it held when the fire was started, while the opening of the throttle produces a disturhance whioh, while less violent than a reversal of the hoiler would he, is sufficient to commingle the gases as above stated.

The class of hoilers in whioh explosions occur more frequently than in any other is the "rotary digester" nsed in many mills. In these hoilers there can he no suspicion of overheated crown sheets, low water or similar causes, as they are heated hy steam and not hy the direct application of fire. There is a continued introduction of water containing air and gases, and the hoiler itself is in constant rotation, so that those gases are thrown out and liherated from the water.

In fact hoilers seldom explode from "nnexplained" or "mysterions" causes when the engine which they supply is working steadily. Under these conditions the water in them is at least partially de aerated hy the drawing out of the steam; for while some air and other gases are introduced with the feed-water, the quantity in the hoiler is very mnch less than when steam is first raised hy starting a fire under a hoiler which is partly filled with air. Moreover, explosions in marine hoilers, whioh are fed with water from the condenser, or distilled water, are almost nnknown.

Experiments made hy heating closed hoilers until they explodéd showed that the destructive effects of the explosion are considerably greater where the hoiler is filled, say two-thirds, with ordinary hydrant water and the rest with air, than where the water has been de-aerated hy allowing steam to escape, carrying with it the confined air and gases, hefore the hoiler was closed and heated to the exploding point.

The anthor olaims that he has not hased his theory npon a single experiment, hut npon a series of experimenta repeated many times nnder conditions varying as much as possihle, and continned so long as to prevent any possihility of mistake; and npon these experiments he hases his explanation of those explosions which are called "mysterious."

PROGRESS OF STEEL POSSIBILITIES OF ALUMINUM.—An interesting feature of the recently published statistical report of the American Iron and Steel Association is the increasing percentage of steel in the total production. Ahout one-third of the har "iron" now manufactured in the United States is steel, so is nearly half of the plate and sheet iron, and 40 per cent of the cut nails and spikes. The rolled iron product, other than nails, only increased 7½ per cent last year, while the rolled steel product, apart from raile, increased 32 per cent. It needs not to say that steel ralls are now replacing those of iron on all the railroads which are efficiently managed. After that change is completed, what then? Will the next reform in order he wholesale snhstitution of aluminnm for the ferrio materiaal, crowding that out of the way as the latter is displacing wood for many structural pnrposes? It is not improhahle. Clay is much more plentiful than iron ore, and recent experiments at least indicate it as possihle that the new metal will ere long he produced as cheaply per unit of volume if not of weight, as its elder hrother. Such a change would revolutionize not a few of our manufactnring processes, and perhaps some of the hahits of the civilized human heing.—*Metal and Eisen Zeitung.*

STRAIGHTENING CASTINGS. — Sometimes a casting is warped in cooling and requires straightening hefore heing nsed. If the piece is to he planed or otherwise finished, it should he straightened hy heating and plaoing weights npon it. If it yields to this treatment it will retain its corrected form after the scale is removed, and throngh all the after processes. But, if the piece is to he used without finishing, it may he straightened hy "pening" with the hammer—striking with the "pene" or wedge-shaped end of the machinist's hammer. This process makes a series of indentations on the convex side of the iron, stretching the "skin" of the casting; hut when these indentations are removed hy after-working, the casting is liable to return to its curved form. In "pening," that portion of the casting that receives the hlow should he immediately over the face of the anvil or hench hlock; in other words, each hlow should find a solid resistance, and the casting should he moved along the face of the anvil as the work progresses.

ROPE TRANSMISSION OF POWER.—The utility of wire-rope transmission has hecome widely recognized; not only among the rugged hills and mountains of the East and far West, where streams go rushing down through caverns and rocky steeps, where no locations for mills or factories are afforded, is this means of transmission of precious power appreciated, hut it is so convenient to nse it that we find on the prairies of the West mills heing operated at a long distance from water-powers hy the wire rope. A few days ago, on a trip through Nehraska, we noticed a rope stretching for nearly a mile from a water-power to a mill that had recently heen hnilt adjoining a railroad, the owners finding it much more to their advantage to have it there, with the switching privileges afforded, than at the dam. The expense of hanling the flour which is thus saved to them will very soon pay for the system of power transmission.—*Modern Miller.*

THE MANNERMAN PROCESS, to which reference has already heen made in these columns, produces steel tnhes from the diameter of a pencil to 15 inches without the necessity of horing. A compound motion of rollers gives a spiral twist to the material in the process of rolling, thereby giving it a strength five to six times that of an ordinary tube of the same weight. The extreme compression to which the material is snhjected gives a quality which enahles the tnhes to he hent and twisted into any form without a flaw in the metal. One tuhe was snhjected to a pressure of 1700 atmospheres without yielding.

THE MANAGEMENT OF MACHINERY.—Prof. C. E. Tompkins, in a recent address said that it is not always the greatest amount of work that can he got out of a machine in a given time regardless of all other conditions that constitutes its economical use. The true economy in the use of all classes of machinery consists in obtaining the greatest amount of good work in a given time without material injury to the machine aside from its natural wear and tear.

HERE AND THERE.—Frank J. Sprague, an American writer, says the modern electric railway may he said to have heen horn in Europe; hut in its youth and younger manhood it is purely American. The compliment is returned hy London *Industries* which says: "It is to Americans that we owe almost all the recent developments in the steam engine. Novel hoilers, valve gears and framings are all of American origin."

SCIENTIFIC PROGRESS.

Rumination in Man.

"By rumination, or 'chewing the cud,' we designate a condition in which the food returns, without nausea, in small portions, from the stomach, through the œsophagus, into the mouth, some time after meals; here it is chewed anew and swallowed.

"Rumination helongs to the normal physiological processes of most herhivora, and forms the most marked characteristic of the whole class of mammals which we call 'ruminants.'

"Here the rumination is a most appropriate arrangement. The herhivorous animals are ohliged to partake of great quantities of food, as the nonrishing value of the grasses is relatively a small one. On the pasture they must make use of their time for gathering and swallowing the grass. Afterward, when they have more time and leisure, they redoce the food to smaller particles and mingle the same with saliva, hy the act of rumination.

"In view of this circumstance, the stomach of ruminating animals differs in construction from that of other animal classes. It consists of four compartments: Paunch, or rumen, honeycomh hag, or honnet, manyplies, or psalter, and reed, or rennet. The first two serve more or less as reservoirs, whereas the two latter contain the glandular elements for digestion.

"At the first act of swallowing, the food materials enter the rumen and the honnet, whereas, after chewing the cud, the food passes directly into the psalter and rennet.

"Chewing of the oud, which is so very important and appropriate for the whole olass of ruminants, occurs, though quite rarely, in man, and is designated then as rumination or merycism.

"For man rumination is unnecessary, and more or less a hindrance. One can hardly define rumination as a disease, for the hodily functions are in no way harmed hy that process, hut as an ahnormal anomalous condition, which must he socially an unoomfortable and disagreeable hurden to its owner."

The above is extracted from a paper recently read hefore the German Medical Society of New York hy Max Einhorn, M. D. The learned doctor described a number of cases of rumination in man, which had come under his knowledge, and he quotes from a large number of authorities on the snhject, dating hack to the year 1618.

Rumination, as treated in Dr. Einhorn's lecture, is very interesting, and appears in full in the *Medical Register* of May 17th.

ANTISEPTIC VALUE OF EUCALYPTUS —A late correspondent of the Selma *Irrigator* says: In soaking up old wine or vinegar casks, we throw a few hlue-gum honghs with their leaves into the water, and it never hecomes putrid, while without the hlue gum we would have to change the water daily to prevent putridity and spoiling of the flavor of anything afterward kept in the cask. We have kept fresh heer e ght days in the hottest weather, hy keeping around it a plentiful supply of green hlue-gum leaves, and changing them daily. A decoction of green leaves is a stronger and more lasting stimulant than tea or coffee, and more salntary in its effects, as it does not cause wakefulness. It seems to have the stimnlating effect of quinine, without any of its injurious qualities. In addition to the above it may he remarked that no worm or insect is ever fonnd upon the eucalyptus tree, or in the earth where its roots permeate. A row of trees planted through an orchard or vineyard will cause insects, worms and caterpillars to vacate that region. The hranches of the eucalyptus nsed in the rooms or windows, or as decorations in dwelling rooms, will cause mosquitoes, moths, fleas and flies to leave the premises, and when the leaves are placed heneath a carpet aronnd the horder of the room, when the carpet is laid, is an insurance against the moth, and hranches placed heneath the hed pillows a protection against fleas.

ELECTRICITY IN AGRICULTURE —The application of electricity to agricnltnre has recently received some attention in France. In an article upon this snhject in *La Lumiere Electrique*, it is pointed ont that seeds which are snhjected to the action of the current hy placing them when wet hetween copper electrodes in long glass cylinders open at hoth ends, and sending a current throngh them from one to two minutes, develop more rapidly and more completely. The plants which resulted from the electrified seeds were larger and of hrighter color than plants from other seeds, hnt the current had no effect on the yield. In the case of peas, heans, harley and sunflower seeds, development took place in from 40 to 60 per cent less time than when the seeds were not snhjected to the influence of the current hefore planting. When large plates were sunk in the earth at opposite ends of the garden plot, and a current passed hetween them, the result was a larger orop, and the growth of vegetahles of enormous size.

THE MOON'S HEAT.—The problem of measuring the moon's heat, says the *St. James Gazette*, has heen solved at last hy Mr. C. V. Boys, one of the professors at South Kensington. By means of quartz filaments he has produced a thermopile of almost fluoredihle delicacy. By this remarkable apparatus he can render sensihle the heat of a candle up to the distance of a mile and three quarters, and hy directing the minute disk of the instrument to the moon he has shown that the warmth received from its reflected light is equal to that given out hy a candle at 21 feet distant. Observation seems to show that, although the moon's face is under the hlaze of an unclouded sun for fourteen days, it remains comparatively cool, and that whatever heating it does ultimately receive is rapidly gained and as rapidly lost.

THE VARIOUS CONDITIONS OF STEAM —We notice, says the Boston *Journal of Commerce*, that many engineers have not quite clearly fixed in their minds the meaning of the terms saturated and superheated steam, particularly the former. Steam may he dry, contain no water, and yet he saturated. Steam not heated above the temperature due to its pressure is said to he saturated, even though it contains no water. If the application of any pressure or the abstraction of any heat would cause steam to hecome a liquid, then that steam was saturated steam. Steam hoiled from a kettle has no moisture; it has a temperature of 212°; it is a dry steam, yet saturated steam; hut the application of pressure or taking away of heat would change it from a vapor to liquid. If the steam issuing from the kettle was heated to 220°, it would stand considerable pressure and the abstraction of heat without changing its form. This is superheated steam. The other, although dry, is saturated steam, this term not requiring the actual presence of moisture.

"BUMPING" OF BOILING LIQUID.—During the distillation of fluids, great inconvenience is frequently experienced, due to the unmanageable "humping" of the boiling liquids. This can be prevented hy placing in the fluid a spiral coil of platinum wire, the coil inclosing some small fragments of pumice stone. The specific weight of the apparatus must he great enough to sink it to the hottom of the receptacle. By this method the liquids hoil quietly. Ashestos of long fiher also answers the purpose perfectly, a hall of the fihers the size of a hazel-nut, placed in the retort, making it possihle to carry on the distillation with safety.

THE EIFFEL TOWER IN A THUNDERSTORM.—From recent experience during thunderstorms, the Eiffel tower at Paris seems to he proof against lightning. On one occasion it was snhjected to a remarkable hombardment from aerial electricity, heing struck hy lightning no less than six times in 11 minutes. Three of the flashes are said to have reached the top of the conductor simultaneously, resulting in a remarkable display and considerable vihration on the part of the hig iron frame. A rattling of the metal was heard, hut no apparent damage was done.

A NEW PROPULSIVE FORCE —It is said that Paul Clifford, a French scientist, has discovered a new propulsive force in a condensed liquefied gas. Three hundred drops of this compound was contained in a small steel receptacle under a rifle-harrel, and each time the trigger was pulled one drop falls into a hreech hehind the hullet. Contact with the air causes it to volatilize instantaneously with an expansive force far exceeding gunpowder and expels the hullet with terrihle velocity, unaccompanied hy either noise or smoke.

BLACK SULPHIDE OF SILVER is now hsing used hy a Parisian firm in the manufacture of all sorts of jewelry, and gives a very pleasing result. The hluish-hlack surface of the metal is stamped with gold and silver designs, apparently in the same way as tortoise-shell work, and the ontcome is a very pretty and tasteful ornament. For mourning jewelry and table ornaments this new process (in which, hy the way, the hlack silver is permanent) ought to prove very tasteful.

SOMETHING NEW.—A new use for the silversmith's art has lately heen developed in Providence, which will probably demand the attention of the world and hring fame to the discoverer of this new feature. This new idea is the oxidization in silver of natural fruit and flowers—something that heretofore has heen only known to the French silversmiths, the secret process heing guarded closely and jealously last it should hecome known ontside of France.

THE LIGHTNING'S FLASH.—Scientists say that the duration of a lightning flash is not infinitesimal, hnt that the flash lasts a measurable time. For example, if one sets a camera in rapid vihration and exposes in it a plate, so as to receive the impressions of the flash, it is fonnd that the impressions appear widened ont on the negative, showing the negative to have moved during the time the flash was in existence.

HIGHT OF LUMINOUS CLOUDS.—A number of photographio impressions of luminous clouds have heen taken during the current year in Germany. The result of comparing the various results obtained at different observatories goes to show that these clouds have the extraordinary altitude of 5½ miles above the sea level.

THE LARGEST STEAM DERRICK in the world is used hy a shipping company at Hamhurg, Germany. It is used for lifting immense weights on and off shipboard, and can pick up a ten-wheeled locomotive with ease.

GOOD HEALTH.

How to Live.

There are twn tbings we chiefly wish for while we llve—health, to make life enjoyable, and length of days to make it lasting. To obtain hcth mainly depends on onrselves.

We do not simply die; we usually kill onrselves. Onr habits, our passions, our anxieties of body and mind, shorten our lives.

The key to health and long life is sobriety in llving. It is tbe fashion to restrict the term sobriety in the nse of intoxicating liqnors.

We say with truth that the drunkard is killing himself, hnt we rarely speak of overeating as a shortener of life.

A sober life implies moderation in all things. "It consists," says Cornan, "in moderate eating, in moderate drinking and in a moderate enjoyment of all tbe pleasures of life; in keeping tbe mind moderately but constantly employed, in cnltivating the affections moderately, in avoiding extremes of heat and cold and in shnnning excessive excitement either of body or mind. A sober life is a life of order, of rule, of temperance—tbat divine sobriety which is grateful to God, friendly to nature, the daughter of reason, the sister of virtue, the companion of temperate living—modest, gentle, content with little, guided by rule and line in all its operations."

It is an important rule to observe and practice for health, comfort nnd onr pence within and without, to attack every ailment and malady at its beginning, to arrest the premonitory symptoms before they take root in our vitals, and gradually or quickly interrnpt the normal action of the organs. A loss of strength, a weakened memory, a tottering walk, all bespeak a mental or physical disorder, which, if not arrested in the early stage, will lead to disease and fatal consequences.

"One can hardly believe," says Reveille, "bow far a little health, well treated, will carry ns."

"And the rule of the sage," says Cicero, "is to make nse of what one has, and to act in everything according to one's strength."—*Ex.*

Leprosy of the Middle Ages.

According to Dr. Morell Mackenxie, leprosy, the sconrge of the middle ages, has not become practically extinct among Enropeans, hut is in reality spreading. It has between 1000 and 1200 victims in Norway, is also found in Portugal, Greece and Italy, and is rapidly spreading in Scily, in the Baltic provinces of Russia, and in France, while the British Islands are not exempt from it.

In the United States cases have been fonnd in California, in some of the States of the Nortbwest, in Utah and in Louisiana. Many cases exist in New Brunswick. In the Sandwich Islands the disease first broke ont in 1853, and there are now 1100 lepers in tbe Molokai settlement alone. The diseace is extending in the West Indies.

The Treatment of Leprosy.

Kate Marsden, whose investigation of leprosy in Rnssia has been mentioned frequently, had interviews with M. Pasteur with the view of ascertaioing whether inoculation could be resorted to. M. Pasteur, however, could hold ont no hope of leprcsy being dealt with in that way. Miss Marsden is anxious that this negative resnlt shonld he promptly known in New Zealand, where hopes have been entertained of the applicability of the Pasteur treatment to Maori lepers. Miss Marsden is about to return to Russia to continne her investigation.

AN AID TO CURING ALCOHOLISM.—We believe that the best authorities are generally skeptical as to there being any sure cure for confirmed habits of inebriety, nnless tbe effort in that direction he aided hy a strong exercise of the will of the nnfortnnate subject of this bad habit. There are, however, many remedies recommended as aids in diverting, or, in a minor degree, satisfying the appetite for strong liquors, which are nndonhtedly of great advantage in some cases; and one of these is thus recommended by a self-styled "rescued man:" "I was one of those unfortunates given to strong drink. When I left off, I felt a horrid want of something I must have or go distracted. I could neither eat, work, nor sleep. Explaining my affliction to a man of mnch edncation and experience, he advised me to make a decoction of grnnd quassia, a half-ounce steeped in a pint of vinegar, and to pnt abont a small teaspoonful of it in a very little water, and to drink it down every time the liquor thirst came on me violently. I found it satisfied the cravings, and it diffused a feeling of stimulus and strength. I continued this cure, and persevered till the thirst was conquered. For two years I have not tasted liquor, and I have no desire for it. Lately, to try my strength, I have handled and smelt whisky, but I have no temptation to take it. I give this in consideration of the nnfortunate, several of whom I know have recovered hy means which I no longer require."—*Scientific American.*

THE USES OF SAWDUST are daily becoming more varied. It has recently been utilized for the manufacture of paper pulp and sheathing paper. It has also been discovered that fine sawdust is unequaled for the dressing of wounds and as a vehicle for medicaments or antiseptics. The sawdust, when freed from splinters and sharp bits of wood and used alone and dry, is a clean and pleasant dressing; it readily takes up and holds the discharges without packing or adhering, and is readily rendered antiseptic hy any of the methods used in the preparation of antiseptic wool and cotton. It is suggested that the yellow pine sawdust, being rich in turpentine, would prove a valnable antiseptic application.

DANGER IN STALE MEAT.—A man was found dead some two years ago in a lodging-house in this city. An analysis of the contents of his stomach was made, and the following report handed in to the coroner: "I have made a chemical and microscopical examination of the stomach and contents of John Dwyer, which shows that his death was probably caused from eating mince pie containing tainted or partially decomposed meat. The chemical analysis demonstrated the presence of a poisonous cadaver alkaloid."

USEFUL INFORMATION.

VALUABLE POINTS BY A PLUMBER.—"If you want a point or two about cleaning waste pipes without sending for a plumber," said a retired member of the fraternity to a New York *Telegram* reporter, who was complaining of the trials of house-ownership, "just listen to me. If I were still in the business I would not give away what I am going to tell you now, hnt as I am out of it I do not see why I may not help a friend. One of the most frequent and trying annoyances," he continued, "is the obstruction to the free, quick outlet of the waste water of the wash-basin, the bath-tnb and kitchen sink. This is caused hy a gradual accumulation of small bits of refuse material, paper, rags, meat-bone or grease, which check and finally entirely stop the outflow of the waste, and then the plumber is called to remove the stoppage with his force-pomp. Sometimes this is accomplished, hnt often the pipe has to he cut, and there is great inconvenience and expense. Just before retiring at night, pour into the clogged pipe enough liqnid sodalye to fill the 'trap,' as it is called—or the bent part of the pipe jnst below the ontlet. Be sure that no water runs into it nntil the next morning. During the night the lye will convert all the offal into soft soap, and the first corrent of water in the morning will wash it away and leave the pipe as clean as new. See? This is practical chemistry, yet few chemists would ever think of it."

WHITE LEAD INJURIOUS.—It is said that painting floors with any color containing white lead is injurious, as it renders the wood soft and less capable of wear. Other paints without white lead, such as ochre, raw nmber or sienna, are not injurious and can be used with advantage. Varnish made hy drying lead salts is also said to he destructive, and it is recommended that the horate of manganese should be used to dispose the varnish to dry. A recipe for a good floor varnish is as follows: Take two pounds of pure white borate of manganese, finely powdered, and add it little hy little to a saucepan containing ten pounds of linseed oil, which is to be well stirred and raised to a temperatore of 360 degrees Fahrenheit. Heat 100 poonds of linseed oil in a boiler nntil ebullition takes place, then add to it the first liqoid, increase the heat and allow it to boil for 20 minutes. Then remove from the fire and filter the solution through cotton cloth. The varnish is then ready for nse, two coats of which may he used with a final coat of shellac, if a brilliant polish is required.

A PROBLEM DEFYING SOLUTION.—The Boston *Herald* has the following nut to crack: Assuming tbat a community of 100,000 workers can produce in a day hy the labor of 10 hours, wealth to the value of $300,000, then if their labor is cut down to eight hours a day, they must either work harder or more skillfully in the shorter period, or there will be one-fifth less wealth to divide among those interested in its production. There is no way of getting over this. At the present time the wages earned are paid, and the capitalist receives his returns from the gross sum of production. If this sum le cut down in any way a loss is inevitable either on the side of the capitalist or wage-earner, or on both sides. While $5 divided among five men will give each $1, there is no process of arithmetic hy which $4 divided among five men will produce the same result.

NOVEL USE FOR BAND SAWS.—The band saw is becoming more popular every day and new uses are found for it from time to time. The Egan Company of Cincinnati, Ohio, are often called upon to adapt it for purposes seldom thought of. A short time since the United States Surgical Bureau at Washington, D C., requested one arranged to saw human skulls and bones. It was a success. Recently this same firm devised a band saw to cut out men's pants from jeans and wool cloth; this it does without fraying at the edges in any way, making a clean and rapid cut; what next?

KEROSENE AND SPIDERS.—A correspondent of the *Scientific American* writes that journal as follows: Did any of your readers ever hear that kerosene attracted spiders? I have a large can of kerosene in a shed, and under the faucet to catch any drops in drawing the liquid, is a tin. Repeatedly I have found this kerosene tin filled with spiders, large and small, which have been drawn to it apparently, for they are not to he seen in the room elsewhere. I should have supposed the smell of kerosene would repel any insect, but these spiders come to the tin as if it were a trap for them, and of course find their death in it.

ELECTRICITY.

Electric Tanning.

The London correspondent of the *Electrical World* writes to that journal as follows in regard to a recent exhibition of the process of electrical tanning: A large party of experts and members of the technical press, lately visited the works of the British Electric Tanning Co., at Rotbsay street, Bermondsey, for the purpose of witnessing the process of tanning hy electricity, which has been in operation on a commercial scale since September last. After the preliminary processes of soaking the skins and denuding them of hair, the hides are placed in revolving drums containing the ordinary tanning liqnor, with the addition of some turpentine. Through these drums, which are 77 feet 6 inches in diameter, and which revolve at a speed of about eight revolutions per minute, a current of ten amperes at a pressure of 100 volts is passed. In the ordinary process of tanning, which takes from five to six months, the mixture of acids and gelatine gives rise to an almost impenetrable coating on the exterior of the hides, and it is the formation of this coating that makes the ordinary process of tanning such a lengthy business. What part is actually played hy the electricity *per se* is by no means quite clear, but it is supposed that the remarkable way in which the process is reduced, viz., to five or six days, is due to the ordinary diffusive action of the electric current, superadded to the heat caused by its passage and the pressure of the gases evolved in the hermitically sealed drums. A large quantity of hides tanned by this process was shown, and many tanning experts expressed themselves much astonished at the results. The British Electric Tanning Co. owns the patents of MM. Worms and Bale. A process of electric tanning, in which the hides are hung on a revolving frame, has been devised hy M. Groth, but I do not think this process has yet been brought into commercial use.

ONE OF THE LATEST APPLICATIONS of electricity that has been reported is to what is called a locomotive telephone. It was tested recently on the B. & O. railroad, and is said to have worked very satisfactorily. The apparatus is described as consisting of a single iron bar laid between the tracks, through which a current of electricity is passed. A brush is fixed upon the engine, which is at all times in contact with the bar, and when two engines approaching each other get within a mile or more apart, bells ring in the cabs, and after the engines have been stopped the engineers can make use of the telephone in abusing each other for being "on my time." This may be a very good thing, says an exchange, but if the uncertainties of the ordinary telephone are any criterion by which to judge, those bells will be very likely to ring at wrong times and give false alarms until they are paid no more attention to than was the boy who cried wolf when there was no wolf, or they may fail altogether. We pin our faith to the block signal.

STEAM BY ELECTRICITY.—A correspondent of the Baltimore *Manufacturers' Record* writing from Chattanooga, Tenn., says: A wonderful invention that will be of great importance to the manufacturing world is being perfected in this city. It is a process for raising steam by electricity. Experiments which have been made on a small scale have been entirely successful and a plant is now being put up to develop the uses of the invention to an almost unlimited extent. The idea is to generate the electricity at a coal mine, or perhaps at a number of them, within a few miles of this city, and bring the electricity to this point by the usual method of the wires. It requires but little figuring to comprehend the saving of money that can be accomplished hy this method of generating steam. Of conrse, it removes all expense of transportation and handling of coal, and is free from all dust and dirt. Its application to the boiler is accomplished hy simply turning a key, which can be done hy a child.

"THE DANGER of an ignorant person in seizing an electric wire carrying a strong current is as great as that to which a person ignorant of the ways of snakes would he subjected if he undertook to take the place of the skilled observer, accustomed to put his arm into a tall jar containing rattlesnakes and take them ont," is Prof. John Trowbridge's graphic illustration of one source of danger connected with electric wires.

ELECTRIC MOTORS IN USE.—It is stated by one of the best known manufacturers of motors in the United States that to-day there are no less than 15,000 motors in use, applied to not less than 200 different industries, and an industrial revolution is taking place equaling, if not surpassing in importance, that attending the introduction of the steam engine, and marvelous in the rapidity of its growth.

ENGINEERING NOTES.

Utilizing Tides for Power.

A Chicago engineer, named C. M. Bartlett, has invented a system of utilizing tidal energy, which is thus described:

A dam several feet above high-water mark is first built across a tidal inlet in such a way as to inclose a space of as large capacity as possible within the predetermined cost of construction. This space is then divided hy a partition dam or orib work into two receptacles as nearly as possible of equal capacity. A considerable economy of power can he effected hy further partitioning off a small area in that quarter of each receptacle which lies adjacent to the ocean and to the main partition dam. Essentially the effect will he to create two sets of receptacles having directly opposite functions. One set of these receptacles will he opened only at high tide, and thus kept as full as possible at all times. In it and adjacent to the main partition dam, that is in the small area which has been partitioned off in this set, will be placed a float of sufficient extent and buoyancy to sustain the necessary machinery and buildings. The power will be generated by means of a current of water drawn by a syphon from this reservoir through a reversed turbine water-wheel and into the other set of receptacles. These latter will he opened only at low tide, and thus kept as nearly empty as possible at all times. During high tide the water drawn through the syphon will of course accumulate in this waste water receptacle and to the extent of its rise therein tend to diminish the effective head of water, hnt it is during this very time that the water in the other set of receptacles is highest and when, with the ebb of the tide, that water is no longer added to, and is therefore diminishing hy reason of the drain through the syphon, then at this time the water in the waste water receptacles is also being drained through the ocean gates of those receptacles in the wake of the outgoing flood. Thus the difference in level between the water in the two sets of reservoirs is maintained at a comparatively unvarying figure. This head of water will, of course, depend upon the highst of the tide and the amount of power desired, but will never be less than two-thirds of the difference between high and low water.

It will thus he seen that the system invented hy Mr. Bartlett comprises:

1. A combination of reservoirs insuring a constant fall of water in one direction.

2. A combined float and syphon automatically adjusting to the rise and fall of the water, and making nse of every inch of head and dispensing with the nse of stationary gates and turbines.

3. The automatic balancing of the turbine, hy placing it in an inverted position in the upward stream of the syphon, thus opposing the force of the stream to the gravity of the wheel and shaft, and avoiding a large percentage of the friction and wear which constitutes the *bete noir* of hydraulic engineering in placing turbines where gravity and the force of the stream act in the same direction.

THE ALASKA RAILROAD.—The subject of bridging Behring Straits is coming up again in a lively manner. Charles L. Colby, with a party of engineers from New York, is said to have gone to Alaska to examine the ground; General Butterfield is reported to he representing the project at St. Petersburg, and Governor Gilpin is drawing attention to it hy conversations with all who take an interest in the subject. It is evident that the *pros* and *cons* are in a fair way of being ventilated. Behring Straits may perhaps become as familiar a topic of discussion as it was in the old days, before the Atlantic cable was laid, when a company was formed to connect Russia and the United States hy a telegraph line via Alaska and Siberia. In these days nothing seems impossible. Railroad-builders can be found who will take a contract to build a line between almost any two points on the globe.

THE GREAT NEW WATERWAY.—The survey of the proposed ship canal from Lake Erie to the Ohio river, has had important results. The project is pronounced hy the engineering corps entirely practicable. A line has been successfully run from the lake to Beaver county, which, when finished, will not exceed 103 miles in length. It crosses the summit 67 feet lower than the old canal did. There is found to he an ample water supply, and plans are made for storage reservoirs.—*Pittsburg Dispatch.*

WATER-WORKS.—It is said that water-works in the United States and Canada have about trebled in the last ten years, growing from 660 in 1881 to 1900 to day. The capital invested is $500,000,000, their annual revenue is $50,000,000, their mains are 30,000 miles long, and they have 2,000,000 taps.

OCEAN SPEED.—An ocean steamer has been projected which, it is claimed, will cross the Atlantic between Queenstown and Sandy Hook in about three days and 13 hours, averaging a speed of 21 to 24 knots an hour.

SETTLING.—The report that the Thames river bridge was settling is true, but there is nothing dangerous in the settling which has taken place, some four or five inches at one end of a 310-feet span.

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Business Announcements.

[NEW THIS ISSUE.]

Vapor Engines and Launches—Regan Vapor Engine Co.
Assessment Notice—Cove Mining Company.
Contractors - Pacific Prospecting Company.
Mining Machinery for Sale—Room 24, 320 Sansome St.
Delinquent Sale Notice—Carmelo Land and Coal Co.
See Advertising Columns.

Passing Events.

While the silver bill signed this week by the President is not all the miners desired, it will doubtless serve to make a better business out of silver mining, and a revival of that interest is looked for. Many low-grade properties, which have been idle for many years, may now have an opportunity for some profit.

The molders' strike still continues with few changes. The men have gone out of one more foundry—Huntington's. Men are still being brought from the East by the foundrymen, and a small percentage of each lot is still being "captured" by the molders. Meantime the shops continue their work about as usual, though, of course, with some inconvenience.

The courts have decided that although a mine may be in a foreign country and its owners foreign, if a contract for purchase is made in California, and the mine is alleged to have been "salted" on the purchasers, the courts of this State have jurisdiction in a trial of the case.

Another Government vessel, built here by the Union Iron Works, is about ready for her trial trip. Meantime, other war-ships are in course of construction at our local ship-yards.

ABOUT $75,000 or $100,000 worth of California marble will be used in the new Mills' building, at the corner of Montgomery and Bush streets, in this city. It will be taken from the quarries in Inyo county.

Silver.

While the Silver bill, which has just become a law, does not place silver exactly where it should be, and still treats it only as a marketable commodity, it is a very long stride toward ultimate free coinage, which may come at the next session of Congress. The new law makes the purchase monthly of four and one-half million ounces of silver compulsory, if offered, and provides for the issuance of certificates, based upon silver, receivable for all private and public debts.

The law is one which will be specially beneficial on this coast, where, since the demonetization of silver, the miners of that metal have been crippled. The heavy discount which has prevailed for so long has made hundreds of mines unprofitable, and in all the silver mining regions numbers have had to close down, throwing thousands of men out of work and entailing great loss upon owners of such properties and the towns dependent on their operations.

In California we were never heavy producers of silver, a couple of million dollars being about the annual output. Still, such mines as those at Calico, and others in San Bernardino county, and still others in Inyo county, have had hard lines for years, many having closed down. In Nevada, there are dozens of mining districts which have been languishing in comparative or positive idleness which should have been, and now will be, active silver producers. The Comstock itself, even though its ores produce so largely of gold, has suffered to considerable extent. Utah, Colorado, Idaho and Montana have all felt the effects of silver depreciation badly, though the latter State is, notwithstanding, the most prosperous mining region in the United States.

With the Government guarantee of certain purchase, a market is assured for the product and much higher prices are expected than prevail at present, though they are now much higher than at this time last year. Doubtless, many mines that have been idle will be started up again and "lively times" come again once more in some of the old silver camps of the coast.

As has been pointed out, however, in these columns, it is not only the silver miners who will be benefited by the enactment of this law, but the farmers, manufacturers and labor interests as well. The details of the law were printed in the PRESS of last week. Silver will still, as a commodity, be subject more or less to speculative influences, but this must be submitted to for the present. The silver men are to be congratulated in having accomplished an advance step, and it only remains to exert such influence as shall, at the next session of Congress, again ennoble the white metal.

A broad effort is to be made to firmly fix silver money in the policies of the American nations. Last week Senator Teller introduced a joint resolution declaring it to be the determined policy of the United States to use both gold and silver as full legal tender money, and instructing the President to invite the Governments of the Latin Union countries and such other nations as he may deem advisable to join the United States in a conference to adopt a common ratio between gold and silver for the purpose of establishing the international use of bimetallic money and securing a fixity of the relative value between those metals, the conference to be held at such place as may mutually be agreed upon by the Executives of the Governments joining in it.

THE MOLDERS' STRIKE.—The shop of F. A. Huntington has been added to those affected by the molders' strike. Mr. Huntington borrowed from the Pacific Iron Works a pattern of an amalgamating pan for which he had an order and he was told by the President of the Union that if he made any articles from those patterns his men would be called out. He concluded to close his business rather than be dictated to, and paid his men off. There were eight molders in this foundry. Another non-Union molder from the Fulton Iron Works was assaulted by strikers while going home from work on Saturday night. Thirty molders came from the East this week, 13 of whom are at work in the foundries in the places of strikers.

THE coal miners at Gallup, N. M., are on strike for a raise of 15 cents per ton.

The Comstock Mines.

All information received from Virginia, Nev., is confirmatory of more active work being done in the Comstock mines than for several years. Prospecting drifts and crosscuts are being run in, with the work tending toward the west lode, which is nearly all gold-bearing. That the work going on is of an important character is evidenced by leading superintendents paying more personal attention to the work than they have for two years past.

From our own and other advices from the mines we give the following brief statements:

Drifting south has commenced on the 1030-foot level in Potosi. In Alpha, on the 600-foot level, they have started a southwest drift to tap the Confidence-Challenge ledge which extends through Con. Imperial. The Hale and Norcross managers are building another reservoir to catch the rich slum that is allowed to escape through their peculiar mode of milling. Our correspondent says that this slum assays from $30 to $40 a ton, which he thinks "is very good alum to come out of $20 ore." He writes that in Overman the ore in the winze widens and improves with depth. In other parts of the mine good ore is found. He asserts that the mill assays should run higher on present showing.

In Confidence, on the 1000 foot level, they are in good ore assaying $60 a ton, which they are running out through Yellow Jacket, but of which no further record is kept. He writes that Hale & Norcross takes out 28 carloads (seven tons to the car) of ore a day, which is put through a milling process peculiar to that section. In Best & Belcher the work is growing more interesting, as it is in Sierra Nevada and Mexican. Utah is doing some important work which deserves watching. Savage is reported to be looking well, but experienced miners fear that old timbers may be run into before long. It is reported, but how correctly we can not say, that the Hale & Norcross shaft will have to be repaired and otherwise improved. The active prospecting work going on in Con. Virginia ought to show good results soon. Mysterious hints about Yellow Jacket are still afloat. In Kentuck, they have commenced drifting on the 1000-foot level. Official letters received (Wednesday) from the Gold Hill mines report that in Belcher they are stoping out on the 1000 and 300-foot levels in 12 feet ore; 362 tons of ore milled assayed $19.66 per ton. The superintendent of Crown Point does not report anything new in the mine, but instead he sent to the office in this city $9,888, which is the net result of last month's work. This money covers the company's June indebtedness, and gives them a "carry-over" of about $550. In two levels in Sag. Belcher they are getting into ore.

The Late Chas. H. Chamberlain.

On Thursday night of last week, ex-Judge Charles H. Chamberlain died in Oakland, at the age of 70 years and eight months. He was a pioneer of this State, having arrived in San Francisco in August, 1849. He started immediately for the mines on the Mokelumne river, going afterward to Montezuma, Tuolumne county. In the spring of 1850, he worked in Soldiers' Gulch, near Tuttletown, and still later, at Dusty Bar and Grand Bar on the Stanislaus river, and at Little Garrote. In 1851, he was at Tuttletown, mining as before, and went in the fall of that year to Columbia. When the celebrated Coolie bill passed the lower house of the Legislature, in 1852, authorizing all persons, who desired, to make contracts in China and the South Sea islands with the people of those countries to labor in California for a period of ten years, and the enforcement of such contracts by imprisonment, Judge Chamberlain, with others, recognized the measure to be an attempt to introduce slavery into the new State. Runners were sent about to call the miners together to denounce the measure, and he drew up the resolutions which were adopted, which were the means of calling public attention to the evils of the bill so that it was eventually killed in the Senate. About the same time he wrote against Chinese immigration, originating many of the arguments since used on that subject. Among the many other public-spirited acts of this gentleman may be mentioned the fact that he drafted a system of mining laws for the miners of Tuolumne county which were remarkable for their equity and justice.

During his career in California, Judge Chamberlain has been a member of both the Senate and the Assembly, having been elected from San Joaquin county. In 1866, he was appointed Receiver of Public Money at San Francisco, which position he held for nearly 20 years, and most of those who had business at the Land Office will remember him. He was an intelligent and progressive citizen who had a host of friends throughout the State. He was a member of the Society of California Pioneers, the State of Maine Association, and the Tuolumne County Association. Judge Chamberlain was always a temperance man, both in principle and practice, and ably assisted his wife, who has been for many years prominent for temperance and benevolent work. No man ever came to this coast more imbued with the sterling qualities of truth, honor and human kindess and justice, and he never lowered the standard of his noble virtues.

His funeral in Oakland was largely attended on Sunday, July 13th. It was remarkable for its evidences of sincere friendship and respect on the part of intelligent men and women in all stations of life.

Death of General Fremont.

Major-General John C. Fremont died in New York on Sunday afternoon, after a sickness of brief duration. He was 77 years and six months old at the time of his death.

General Fremont's name is closely identified with the early history of California, he having been one of the most prominent figures in the events which led to its cession to the United States.

The engraving upon another page of this issue is doubtless one of the finest portraits of Fremont ever produced, and the fact that it represents him in the prime of his manhood, rather than after age had preyed upon the beauty of his countenance, will make it the more acceptable to his California friends. In connection with the portrait we give a brief sketch of his life, so full of effort and accomplishment, and so intimately interwoven into the history of the Great West.

He was born in Savannah, Ga., in 1813. In 1833, he obtained a position as teacher of mathematics in the U. S. Navy, which he kept a few years, and then went into surveying and civil engineering. In 1838-39, he accompanied M. Nicollet, a Frenchman and a distinguished man of science, in explorations of the country between the Missouri and the British line. These explorations were made under the authority of the Government, and while engaged in them in 1838, Fremont received from President Van Buren, under date of July 7th, a commission as second lieutenant in the corps of topographical engineers.

In 1842, Fremont projected a geographical survey of the territory of the United States from the Missouri river to the Pacific Ocean, the feasibility of an overland communication between the two sides of the continent being a leading idea in the scheme of explorations. He applied to the War Department for employment in this service, and having received, at his own suggestion, instructions to explore the Rocky mountains, and particularly to examine the South Pass, he left Washington, May 2, 1842, and on June 10th began his expedition from a point near the mouth of the Kansas river, a few miles beyond the Missouri border, whence he proceeded up the Platte river, through bands of hostile Indians, to the South Pass, which he carefully examined.

He next explored the Wind River mountains, the loftiest peak of which, 13,750 feet above the sea, he ascended August 15th, accompanied by four men. This mountain is now called Fremont's Peak. From the Wind River mountains, which he left August 18th, Fremont returned to his starting place by nearly the same route that he had followed going out. He reached the mouth of the Kansas October 10, 1842, after an absence of four months. He had encountered much hardship and many perils, and had successfully accomplished all the objects of the expedition. Over the whole course of his extended route, he had made barometrical observations to ascertain the elevations both of the plains and of the mountains, and astronomical observations for latitudes and longitudes.

Immediately after the publication of the report of this expedition, he planned another of a more comprehensive character. He determined to extend his explorations across the continent, and to survey the then unknown region lying between the Rocky mountains and the Pacific ocean. In May, 1843, he commenced his journey with 39 men and proceeded up the Kansas river far enough to ascertain its character, and then crossed over to the Platte, which he ascended to its source in the mountains, where the Sweetwater, one of its tributaries, springs from the neighborhood of the South Pass. He reached the pass August 8th, went through it, and saw the head waters of the Colorado flowing toward the Gulf of California. On September 6th, after travelling over 1700 miles, he came in sight of the Great Salt Lake, of which no accurate account had ever yet been given, and of which very vague and erroneous notions were entertained.

His investigations effected important rectifications in our geographical knowledge of this portion of the continent, and had subsequently a powerful influence in promoting the settlement of Utah and the Pacific States. From the Salt Lake he proceeded to the upper tributaries of the Columbia river, whose valley he descended, until on November 4th he reached Fort Vancouver, near the mouth of the Columbia. On November 10th he set out on his return to the States. He selected a southeast route leading from the lower part of the Columbia to the upper Colorado, through an almost unknown region crossed by high and rugged mountain chains. He soon encountered deep snows which impeded his progress and forced him to descend into the great basin, and presently he found himself in the depth of winter in a desert, with the prospect before him of death to his whole party from cold and hunger. By astronomical observation he found that he was in the latitude of the bay of San Francisco, but between him and the valley of California was a range of mountains covered with snows which the Indians declared no man could cross

and over which no reward could induce them to guide him.

Fremont boldly undertook the passage without a guide, and accomplished it in forty days, reaching Sutter's Fort, on the Sacramento, early in March, with his men reduced almost to skeletons, and with only 33 out of 67 horses and mules remaining, and those that survived so weak and thin that they could barely walk while led along. He resumed his journey on March 28th and got back to Kansas after an absence of 14 months.

Fremont was brevetted Captain in January, 1845, and in the spring of that year he set out on a third expedition to explore the great basin and the maritime region of California and Oregon. The summer and until October was spent in examining the head-waters of the rivers, whose source was the dividing ridge between the Pacific and the Mississippi Valley. Leaving the shores of Salt Lake in October he proceeded to explore the Sierra Nevada, and in the dead of winter again crossed the range into California for supplies. He made his way into San Joaquin valley, where, leaving his men to recruit, he went himself to Monterey to obtain from the Mexican authorities permission to proceed with his exploration. Permission was first granted and then revoked, and he was ordered to leave the country without delay. This he refused to do, as his men were in no condition to move at the time. The Mexican Governor Castro prepared to attack the 62 Americans of the party, but Fremont took up a position 30 miles from Monterey and built a rude fort, where he hoisted the American flag. No active steps were taken by either party and shortly after Fremont started up Sacramento valley for Oregon, but he was recalled by advices from Washington directing him to watch over the interests of the United States in California, there being fears that it would be turned over to England. Fremont promptly returned and the settlers flocked to his camp, and in less than a month Northern California was freed from Mexican authority. He joined the naval forces at Monterey and organized the California Battalllon, a mounted force of which he was appointed Major. He was also appointed by Commodore Stockton Military Commandant and civil Governor of the Territory. War having broken out between the United States and Mexico, he was engaged in suppressing insurrections by the Mexican inhabitants and preventing a war with the Walla Walla Indians. January 13, 1847, he concluded with the Mexicane articles of capitulation, which terminated the war in California.

A relic of these warlike times was visible until recently in the shape of a trench made by Fremont on Fort Hill, now a rich residence portion of Los Angeles and overlooking the finest business portion of the city, then a happy Mexican village.

He left for "the States" in June, 1847, and arrived in Washington in September. October 14, 1848, Fremont, at his own expense, organized an expedition to cross the continent. He had 33 men and 120 mules, and with these he made his way along the upper waters of the Rio Grande, through the country of the Utes, Apaches, Comanchee and other tribes then at war with the United States. He had resigned his position as Lieutenant-Colonel, and was no longer an officer of the Government. His object was to find a practicable passage by this route to California. In crossing the Sierras his guide lost his way and terrible suffering ensued. All of his animals and one-third of his men perished. Cannibalism was resorted to. Finally, he succeeded in retracing his steps to Santa Fe, N. M. Gathering together 30 men he made another start for California, and succeeded in reaching Sacramento in the spring of 1849.

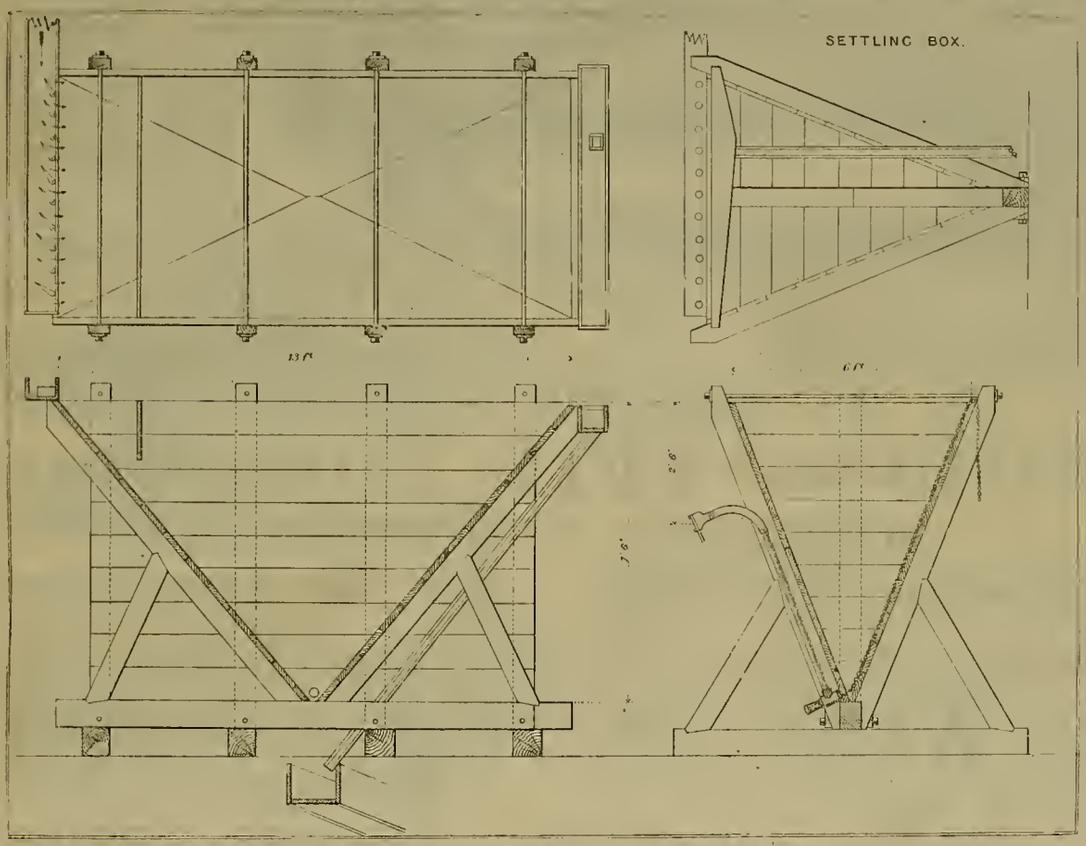
Fremont now determined to settle down in California. He had bought the Mariposa estate in 1847, and on this large tract were a number of valuable gold mines. His title to the property was contested and he was kept in litigation until 1855, when the suit was decided in his favor by the Supreme Court of the United States. In 1849, he received from President Taylor the appointment of Commissioner to run the boundary line between the United States and Mexico. In December, 1849, the Legislature of California elected him on the first ballot as one of the two Senators to represent the State in the United States Senate. He resigned his Commissionership and went to Washington by way of the Isthmus. He took his seat in the Senate September 10, 1850, the day after the admission of California as a State, and in drawing lots for the terms he drew the short term, which expired March 31, 1853.

Fremont returned to California on the first steamer that sailed after Congress had adjourned. For two years he devoted himself to his private affairs, visiting Europe in 1852. In 1852, while in the Senate, Baron Humboldt sent him "the great golden medal for progress in the sciences." A few months earlier the London Royal Geographical Society sent him the "Founders' Medal." While in Europe he learned that Congress had made an appropriation for the survey of three routes from the Mississippi valley to the Pacific, and he returned to the States immediately for the purpose of fitting out his fifth expedition on his own account. He left Paris in June, 1853, and in September was already marching across the continent. He found the pass on the line of latitude 38 and 39 degrees, reaching California in safety. For 50 days his party lived on horseflesh, and for 48 hours at a time were without food.

With such a record of travel in these unknown regions, he fairly earned the title of "The Pathfinder," which he has held so long. He was in 1856 a candidate for the Presidency of the United States, but was defeated by Buchanan. In 1858 General Fremont returned to California. When the civil war broke out General Fremont went to the front and did good service. He resigned his commission in 1862. In 1877, he was appointed Governor of Arizona by President Hayes. Since the expiration of his term of office he has lived in retirement and engaged himself in civil pursuits.

At the last session of Congress, General Fremont was placed on the retired list of the army, and then for the first time in several years began to enjoy a comfortable income. He was the author of several books detailing his work of exploration west of the Mississippi.

General Fremont was singularly fortunate in his domestic relations. In October, 1841, he married Jessie Benton, a daughter of the well-known Senator "Tom" Benton, and in her he found a true helpmeet, who ably forwarded his various plans. She is a lady of varied attainments, literary and other, and is well known in social circles in New York and Washington. She is at present in Los Angeles, in this State, with her unmarried daughter Elizabeth. Mrs. Fremont's friends will at once urge that a pension be given her, as the little she makes by her literary labors is entirely inadequate for their support. A bill has already been introduced in Congress toward that end. A movement is talked of by the Native Sons of the Golden West looking to the erection of a monument and the eventual burial of Fremont's body in Golden Gate Park, San Francisco.



POINTED SETTLING BOX FOR QUARTZ MILLS.

Settling Boxes.

The regular settling-tanks used in silver mills before pans and for retaining tailings in some places require digging out and changes of the pulp flow from one to the other; they are therefore not adapted to the purposes of a continuous working process. Where tailings are caught in large pits it is frequently seen that the settling is not so perfect as the large size employed would warrant, and this is due to the surface currents and channels cut in the deposited material when it fills to the surface. The large, pointed boxes, if properly built, are deserving of more attention than they have yet received for many purposes. Where water has to be used in part over again in a mill, a series of these boxes will do far more effective work than pits or settling-tanks, and require no attention or labor; they will deliver a small stream of thick concentrated pulp at the bottom and give an overflow of almost clear water at the top.

To make them effective, however, there are several points which must not be ignored. (1) Proper angle at the bottom to insure descent of slimes—not less than 50 degrees from the horizontal; (2) proportioning of water inflow to capacity; (3) avoiding too small a discharge opening at bottom; (4) preventing surface currents from the inflow to the overflow end; (5) preventing ingress of coarse sand, chips and other obstructing matter.

The accompanying engravings show complete details and dimensions of a large pointed box that is of sufficient size to handle the pulp and water from five or ten stamps, according to size. The cuts and description are taken from a new work published by E. and F. N. Spon, 12 Cortlandt St., N. Y., entitled "Losses in Gold Amalgamation," with notes on the concentration of gold and silver ores, by Walter McDermott and P. W. Dofield. It will be noticed that a partition extends across the box near the inflow end, dipping well down into the water, so as to cut off surface currents and insure a mixture of the incoming pulp with the whole mass of water in the box; in the absence of this, currents of muddy water will be seen flowing through the clearer mass direct to the outflow end.

A frequent mistake of millmen in making flat settling-tanks is to assume that length is all-important in settling slime, and to put in too many zigzag partitions, so as to force the water current to take as long a course as possible. This frequently destroys the very advantages sought, by making a comparatively rapid surface current in narrow channels. The proper means to insure settling is to diminish the speed of the current, not to lengthen its line course.

The capacity of the box shown will depend, of course, in the perfection to which settling has to be carried. When it is a matter for settling for pan amalgamation, the greatest care is necessary, because the chlorides and sulphides of silver are apt to be exceedingly light and flaky in form. At the Montana mine, 10 boxes of the kind shown in the cuts were put in (by Messrs. McDermott and Dofield) and received the settled discharge from 50 stamps handling 105 tons of ore daily, together with the great excess of water resulting from amalgamation, and then did excellent work with almost clean water overflow. Enough was accomplished to prove the complete efficiency of the boxes and to justify the conclusion that with proper arrangements a great improvement could be effected over the tank system of settling for pans.

Academy of Sciences.

The regular meeting of the California Academy of Sciences was held Monday evening, July 7th, President H. W. Harkness presiding.

Additions to the museum were as follows: William Barber, a live scorpion from Ross valley; Mrs. C. W. Knox, Oakland, young of canary in first plumage; L. Beldieg, Stockton, skin of least bittern; Wm. M. Willey, San Francisco, abnormal egg of chicken; E. D. Flint, Oakland, cranium of *Scalops Townsendi;* James L. Ord, Arizona, *Heloderma Suspectum,* (Gila monster), Melville Attwood, fossils from Pinmas county. Additions to the library were reported as follows: From correspondents 156, by donation 4, by purchase 25, total 185.

F. Gutzkow gave some interesting information regarding a diatomaceous earth from Sonoma county.

This mineral which is found in many places in California consists chiefly of silica and water and is of considerable economic importance. It has been used for building; as a polisher under the name of electro-silicon; in glass-making; and as an absorbent for nitro-glycerine in the manufacture of giant powder, etc. That obtained in California unfortunately has been found unfit for the manufacture of giant powder and the presence of a small quantity of iron prevents its being used for making white glass. Mr. Gutzkow stated that he had devised a cheap and efficient method of eliminating the iron; the method depends on the volatility of ferric chloride.

Prof. Carl Eigenmann then followed with an interesting talk on salmon and the salmon trout, illustrated by many specimens of each, especially the latter, secured during a recent stay at Lake Tahoe. The subject is of special interest as bearing upon troubles that have arisen between the Fish Commission and alleged violation of the law as to what really is a salmon and what a salmon trout. Both fishes belong to the genus *Salmonidæ,* which also includes the white fish and greylings.

This genus is noted for the great variability of the species, the age, season, water, food, kind of bottom, etc., producing such variations that in some cases where a large trout and a small salmon are compared it is almost impossible for any one but a scientist to distinguish between them. He had been sold a salmon trout for a salmon in the city markets, and the fisherman grew wroth at being told it was the former.

At Lake Tahoe the fishermen divide the trout caught there into seven species, but the scientist would class them all as of one species, differing somewhat in peculiarities at different ages and from local causes.

The professor stated that the trout were spawning in the lake this year, whereas they had formerly ascended the streams for that purpose, and that this might be owing to the extreme hight of the waters, or to their low temperature, but the fishermen attribute it to the intelligence of the fish. The Fish Commission has established box-traps at the mouth of the streams, in which the fish are caught as they start to the spawning ground, are stripped of their spawn to supply the hatcheries and then returned to the lake. To avoid this unnatural process, the fishermen contend, is the cause of the fish spawning in the lake.

The Pacific Coast salmon of commerce, the salmon that is used for canning, is confined to the west coast of America, though it exists also in the eastern waters of Asia. It is a deep sea fish, ascending the waters of rivers to spawn. It is the popular opinion that after depositing its spawn the fish descends again to the ocean. The lecturer gravely doubted if the salmon that ascend the fresh water streams ever again descend. Many of them heat themselves fairly to death against the rocks and pebbly bottoms in their efforts to reach the upper waters, and on many of them a fungus grows, which in cases eats holes in the skin. It is possible that those whose progress is barred by dams or falls may return to deep water.

The male salmon is readily distinguished, when caught on its up-stream journey, from its female consort, by having a hooked snout. The salmon caught in the sea never shows this peculiarity.

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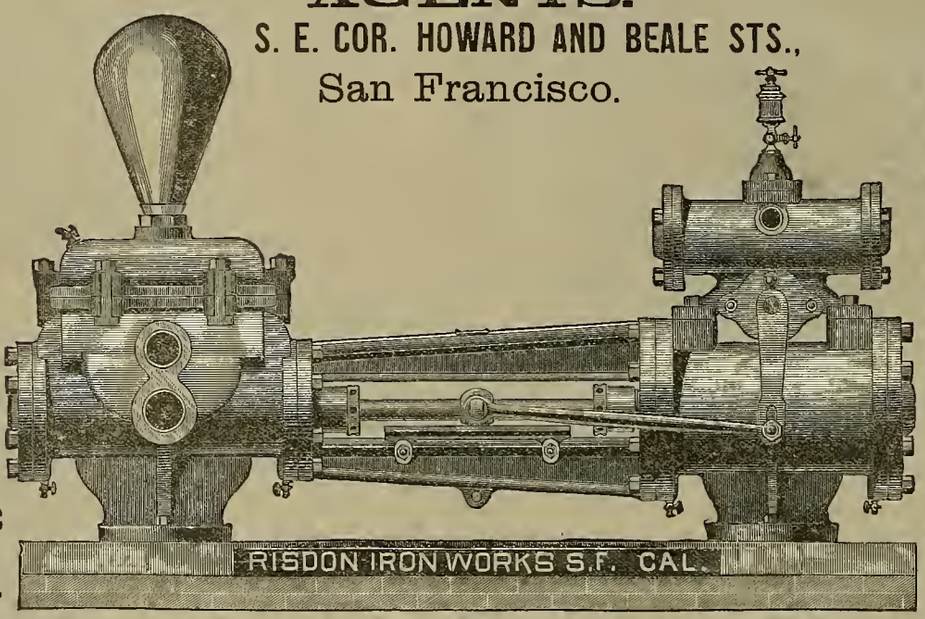

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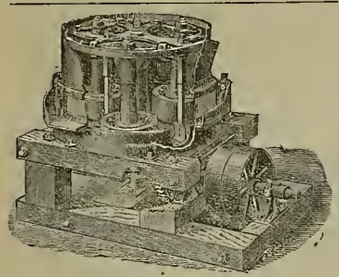

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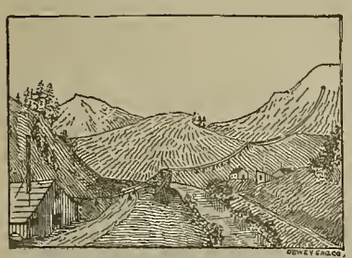

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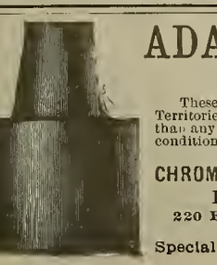

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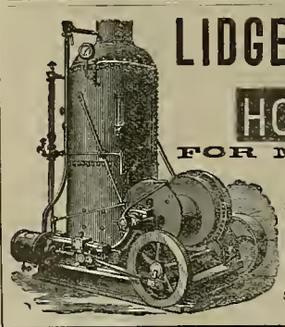

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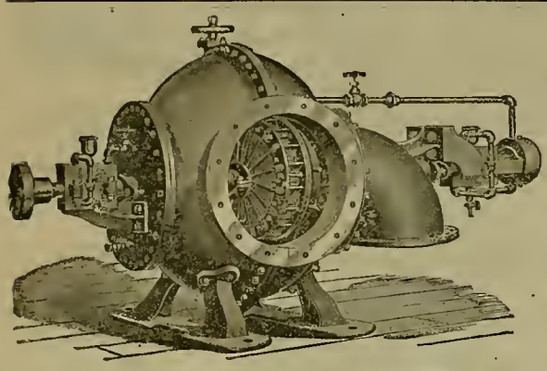

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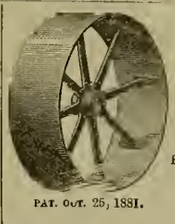

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 17, 1890.

General trade continues quiet, but the outlook is favorable for a largely increased fall business.

The fall in the price of iron for prompt shipment and on the way is considered favorable to the iron manufacturing industry.

The final passage of a silver bill more favorable to the white metal than its predecessor, is accepted as a sure forerunner of more active times in the mining industry on this coast.

The money market is fairly easy, with no marked stringency looked for until after next month.

QUICKSILVER.—Receipts the past week aggregate 256 flasks, and exports by sea, 43 flasks. The market continues moderately active and firm.

MEXICAN DOLLARS—The market sbows more buying in a small way by Chinese, who fear still higher prices. It is difficult to obtain correct quotations of this market, owing to large holders being out of the market except at 90 cents, while buyers name 87½@88 cents.

SILVER—The market abroad gradually strengthened up to to-day, when there was a shading off, London being quoted at 50d. against 50 5-16d. on yesterday, and New York, $1.09 against $1.09¾ on yesterday. In our market there is very little silver offering, owing to holders believing that a much better price will be obtained in next month. As near as can be ascertained, very little if any silver can be bought here at less than $1.10, and it will take $1.15 to draw out any large quantities. Among well-informed mining men it is freely asserted that the production of silver in this country will not sbow much of an increase, probably not to exceed 1,500,000 ounces a year, even with the price advanced to $1.15 or more an ounce.

BORAX—Receipts the past week aggregate 494 ctls., and exports by sea 1001 ctls. to New York. The market is easy, but not quoted lower.

LIME—Receipts tbe past week aggregate 3465 bbls. The demand shows a slight increase.

LEAD—The market is fairly firm. The consumption in this State shows a steady increase.

TIN—Exports by sea the past week aggregate 106,250 lbs. to Santa Rosalia. The market is dull, but not quoted lower. The higher price of silver has a favorable influence on tin abroad.

COAL—Imports tbe past week aggregate as follows: Seattle, 7094 tons; Comex, 4300; Coos Bay, 700; Tacoma, 4878; Nanaimo, 667; total, 17,639 tons. The market appears to be unsettled. Buyers believe that with the strike at the Wellington mine settled, prices will shade off, while importers are inclined to the opinion that it has continued so long, the supply from that locality will not prevent the market from advancing when the winter demand sets in. The coast collieries' output is quite liberal, wbile the list of vessels loading coal for this port at Newcastle, N. S. W., and at Sydney shows a gradual increase.

COPPER—The market is strong, with the outlook favorable for continued strength. London cables report that French holders are still feeding the market. It is stated that when their boldings are closed out prices abroad will go still higher. New York mail advices report as follows: Lake Superior ingot is no longer offered at 16½ cents, and there seems to be a limit upon the quantity tbat may be obtained at 16¾ cents. The prices generally quoted are 17 cents for prompt and near luture delivereies and up to 17½ cents for distant future. Arizona is still held at 15½ cents and common casting brands at about 14¾ cents. Copper, at present tied up in litigation, can, it is said, be disposed of wlthout difficulty at prices within a fraction of those now current on the market. In point of fact, there is a standing offer of a remarkably full price for the entire amount."

IRON—English iron on passage and to load is lower. This will unquestionably affect the spot market. Consumers are buying sparingly, not caring to anticipate their wants.

San Francisco Metal Market.

WHOLESALE.

	THURSDAY, July 17, 1890.
ANTIMONY	22½@ —
BORAX—Refined, in carload lots	8 @ —
Powdered " " "	8 @ —
Concentrated " " "	7¾@ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheathing	23 @ 25
Ingot, jobbing	20 @ —
do, wholesale	18 @ —
Fire Box Sheets	23 @ 25
LEAD—Pig	4½@ 5½
Bar	6 @ —
Sheet	7 @ —
Pipe	6½@ —
Shot, discount 10% on 500 bags Drop, ₱ bag	1 55 @ —
Buck, ₱ bag	1 85 @ —
Chilled, do	2 05 @ —
QUICKSILVER—By the flask	58 00 @ —
Flasks, new	— @ —
Flasks, old	55 @ —
TINPLATE—B. V., steel grade, 14x20, to arrive	— @ —
B. V., steel grade, 14x20, spot	4 80 @ —
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	6 00 @ —
do, do, 20x28	12 00 @ —
Pig tin, spot, ₱ lb	23½@ —
CHROME IRON ORE, ₱ ton	10 00@ —
IRON—Bar, base	3 @ 3½
Norway, base	4½@ 5½
Steel—English, lb	16 @ 20
Canton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —

	Spot.	To Load.
IRON—Glengarnock ton	34 00 @ —	30 @ —
Eglinton, ton	34 00 @ —	30 @ —
American Soft, No. 1, ton	— @32 00	30 @ —
Oregon Pig, ton	— @31 00	— @ —
Puget Sound	34 00 @ —	— @ —
Clay Lane White	@28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	@ —	@ —
Langloan	34 00 @ —	30 @ —
Thorncliffe	34 00 @ —	30 @ —
Hartsherrie	34 00 @ —	30 @ —
Barrow	34 00 @ —	30 @ —
Thomas	33 00 @ —	— @ —
Cargoflcet	30 00 @ —	26 @ —

THE Eureka Consolidsted mine, Eureka, Nev., announoes a dividend for next month, the first since July, 1888.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Almont M Co	Arizona	2	½	July 12	Aug 13	Aug 30	S Harman	302 Montgomery St
Belcher M Co	Nevada	49	50	June 27	July 31	Aug 21	C L Perkins	327 Pine St
Bodie Cons M Co	California	12	25	June 16	July 24	Aug 22	B L Burling	309 Montgomery St
Bona Fors M Co	California	1	5	June 13	Aug 10	Sept 5	E K Taylor	12 Montgomery St
Coso Pacific M Co	California	12	10	Jun 21	July 28	Aug 20	F E Luty	339 Pine St
Crescent M & M Co	California	4	25	Jun 24	Aug 2	Aug 29	J H Isham	310 Pine St
Crocker M Co	Arizona	9	15	June 16	July 25	Aug 25	N T Messer	309 Montgomery St
Crujkshank G M Co	California	1	10	Jun 27	Aug 14	Aug 28	E J Koch	211 Sansome St
Exchequer M Co	Nevada	29	25	July 10	Aug 14	Sept 4	C E Elliott	309 Montgomery St
Golden Prize Con M Co	Nevada	4	25	Jun 19	July 30	Aug 18	C D Bennett	339 Pine St
Gover M Co	California	2	25	July 15	Aug 20	Sept 6	Gray Dew	13 and 15 Fremont St
Gray Eagle M Co	California	18	6	July 1	Aug 4	Aug 25	J M Buffington	3 3 California St
Mayflower Gravel M Co	California	47	30	June 7	July 10	July 31	J Mo izio	328 Montgomery St
Silver King M Co	Arizona	3	20	June 9	July 17	Aug 11	A Waterman	309 Montgomery St
Standard Cons M Co	California	3	50	June 2	July 15	Aug 14	J W Pew	310 Pine St
Tierakoff G M Co	California	4	1	June 9	July 26	Aug 23	W J Garnett	308 Pine St
True Cons M Co	California	9	2	May 26	July 21	Sept 15	J C Bates	434 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION	SECRETARY	OFFICE IN S. F	MEETING	DATE
Benton Cons M Co	California	V B Allen	330 Pine St	Annual	July 30
Carmelo Laud and Coal Co	California	W T Baggett	415 Montgomery St	Auuual	July 21
Lady Washington Cons M Co	Nevada	L Osborn	309 Montgomery St	Annual	July 30
South Feather Union M Co	California	A Halsey	328 Montgomery St	Annual	Aug 1
Union Cons M Co	Nevada	A W Barrows	3 3 California St	Annual	July 21
Yellow Jacket M Co	Nevada	W H Lauvels	Gold Hill	Annual	July 21

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gato	309 Montgomery St	25	Apr 5
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	05	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	Jun 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	July 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING June 26.	WEEK ENDING July 3.	WEEK ENDING July 10.	WEEK ENDING July 17.
Alpha	1.55 1.70	1.30 1.70	1.35 1.50	1.30 1.40
Alta	1.30 1.50	1.30 1.50	1.25 1.40	1.25 1.30
Andes	.75 .85	.65 .80	.65 .70	.60 .70
Belcher	3.00 3.55	2.50 3.50	2.75 3.30	2.80 3.15
Best & Belcher	3.70 4.25	3.15 4.20	3.35 4.50	3.15 4.25
Bullion	3.25 4.60	3.40 4.15	3.25 3.70	3.15 3.65
Bodie Con	.50 .65	.55 1.45	1.10 1.45	.85 1.10
Bulwer	.25	.25 .35	.25 .35	.25 .30
Commonwealth	3 50 3 65	3.55	....	....
Con. Va. & Cal	4.85 5.25	4.75 5.25	4.55 4.75	4.00 4 60
Caulfield	3.30 3.70	2.60 3.50	2.75 3.50	2.90 3 15
Challar	4.10 4.85	3.50 4.60	3.75 4.15	3.65 3.95
Confidence	6.75 7.37	6.00 7.25	7.25 7.50	6.50 7.37
Con. Imperial	.45 .50	.35 .50	.40 .45	.40 ....
Caledonia	.50 .65	.40 .65	.50 .55	.45 .50
Crown Point	3.00 3.50	2.50 3.45	2.70 3.25	2.80 3.15
Crocker	.20	.... .20	.20 .20	.20 ....
Del Monte	1.40 1.50	1.40 1.50	1.40 1.70	1.55 1.80
Eureka Con	3.95 4.00	....	....	4.00 4.25
Exchequer	1.20 1.50	.95 1.35	1.00 1.20	.85 .95
Grand Prize	.55	.60 .70	.65 .70	.50 .65
Gould & Curry	2.75 3.25	2.25 3.15	2.30 2.80	2.55 3.05
Hale & Norcross	3.35 3.85	2 70 3.55	2.95 3.50	3.0 3.30
Julia	.35 .40	.30 .35	.25 .30	.25 .30
Justice	1.50 1.75	1.50 1.75	1.55 1.60	1.50 1.10
Kentuck	1.60 1.8	1.25 1.85	1.45 1.60	1.40 1.50
Lady Wash	.35 .40	.35 .40	.35	.35 .40
Mono	....	.45 .60	.60 .60	.60 .65
Mexican	3.50 4.15	3 05 4.15	3.05 3.25	3.10 3.40
Navajo	.40 .50	.50 .55	.60 .75	.70 .75
North Belle Isle	1.30 1.45	1.40 1.50	1.25 1.50	1.40 1.50
Nev. Queen	.75 .90	.75 .90	.90	.85 1 00
Occidental	1.60 1.85	1.45 1.85	1.65 1.85	1.60 1.75
Ophir	4.50 5.12	4.35 5.12	4.35 4.75	4.25 4.55
Overman	2.65 3.40	2 45 3.30	2.55 3.05	2.70 2.95
Potosi	7.25 10.12	7.62 9.25	7.62 8.50	7.25 8.00
Peerless	.25	.... .25	.25	.25 ....
Peer	.25	.... .20	.20 .25	.30 ....
Savage	4.15 5.00	3.80 4.90	3.90 4 30	4.20 4.85
S. B. & M	2.15 2.45	1.60 2.10	1.70 2 0	1.90 2.00
Sierra Nevada	3.15 4.25	3.00 4.30	3.20 3.45	3 25 3.55
Silver Hill	.40 .50	.35 .50	.35 .4	.35 ....
Scorpion	.25	.... .30	.25	.25 .30
Union Con	3.00 3.85	2.60 3.80	2.70 3.00	2.75 3.10
Utah	1.05 1.40	.90 1.40	1.05 1.20	1.00 1.10
Yellow Jacket	3.10 3.50	2.60 3.50	2 80 3.40	3.00 3.35

Sales at San Francisco Stock Exchange.

THURSDAY, July 17, 9:30 A.M.

270	Hale & Nor	3.05@3.10	
300	Hendricks	40c	
300	Alpha	1.35@1.40	
100	Kentuck	1.45	
50	Belcher	2.80	
200	Nava n	75c	
100	Best & Belcher	4.00@4.05	
100	North Belle Isle	1.30	
50	Bodie	1.20	
100	Occidental	1.65	
530	Bullion	3.55@3.60	
200	Ophir	4.30	
50	Challenge	2.90	
252	Potosi	7.75	
100	Challar	3.85	
875	Savage	4.50@4.55	
60	Con. Cal & Va	4.15	
100	Seg. Belcher	1.90	
150	Con. Imperial	40c	
100	Sierra Nevada	3.35	
300	Crocker	30c	
100	Union	2.90	
140	Crown Point	2.90	
400	Utah	1.15@1.10	
200	Exchequer	85c	
150	West Comstock	40c	
440	Gould & Curry	2.80	
150	Yellow Jacket	3.20	

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 16.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	48½	1 06	$16 50	$4 52½	$21 05
Friday	48⅝	1 06¼	16 50	4 55⅛	21 10
Saturday	48⅜	1 07	16 60	4 52½	21 10
Monday	49½	1 08⅛	16 70	4 52½	21 45
Tuesday	50	1 09⅛	16 70	4 50	21 45
Wednesday	50 5-16	1 09⅜	16 75	4 50	21 45

NEW YORK, July 16.—Quicksilver firm, 75@76c. Borax steady, 8¾@9c. Lake Copper nominally $16.50@17 spot; Arizona, $15.50; casting, $14 75. Pig Lead inactive, $4.52½ spot.

THE Coronado Foundry at San Diego has just finisbad casting 500 iron retorts for Spreckels' sugar refinery at San Francisco. Tbey are eight feet long and will be used for burning bone-black.

PATENTS!

DEWEY & CO'S

Scientific Press Patent Agency

OLDEST ABLEST. SAFEST. BEST. 220 Market St., S. F

FOR SALE.

In Southern Part of State,

20-STAMP STEAM QUARTZ MILL

With Corliss Engins.

Also 6-inch Cornish Pumping Plant with Corliss Engine; also Single Drum Hoisting Engins, Boilers and Cass, all in good repair. Apply to Room 24, 320 Sansome Street, San Francisco.

The Regan Vapor Engine Company.

Attention is called to the advertisement of this company on another page. The Regan engine has passed the experimental stage, and the large number sold (over 150) witbin a year, and now in successful operation on this coast, is as good evidence of its practical usefulness as need be offered.

Where the original purpose of this company was to supply a small power, cheap and conveninent for light requirements, it has enlarged its scope by careful steps, until now engines are being built up to as high as 60 h. p., with a prospect of being able to furnish a still greater capacity. The great economy and safety of these engines, and the almost endless use to which they are adapted, make them deserving the careful attention of all who require a motive power for any purpose. While many testimonials of satisfaction from those who have their engine in daily use are in the hands of the manufacturers, a still greater evidence of the Regan Vapor engine's merits is the fact that it has been adopted by Thos. Kane & Co. of Chicago and Racine, the largest launch builders in the United States, after having experimented for years to secure a perfect motor for their launches. A large number of engines ranging in sizes from ¾ to 60 h. p. are now in course of construction. Send for illustrated catalogue. Regan Vapor Engine Co., 221-223 First Street, San Francisco, Cal.

THE new cruiser San Francisco, built at the Union Iron Works, is on the dry-dock at Hunter's Point being cleaned preparatory to her trial tests in the Santa Barbara channel.

Assessment Notices.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of Works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of July, 1890, an assessment, No. 18, of 6 cents per share, was levied upon the Capital Stock of the corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of August, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 25th day of August, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California Street, San Francisco, California.

GOVER MINING COMPANY—LOCATION of principal place of business, San Francisco, California. Location of works, near Dr, town, Amador county, California.

Notice is hereby given that at a meeting of the Board of Directors held on the 14th day of July, 1890, an assessment (No. 2) of twenty-five cents (25c) per share was levied upon the capital stock of the Corporatioo, payable immediately to the Secretary, at the office of the Company, 13 and 15 Fremont street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Wednesday, the 20th day of August, 1890, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SAT RDAY, the 6th day of September, 1890, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

GRAY DEW, Secretary.

Office, 13 and 15 Fremont St., San Francisco, California.

DELINQUENT SALE NOTICE.

CARMELO LAND AND COAL COMPANY. Location of principal place of business, San Francisco, California; location of works, Monterey county, California.

Notice—These are delinquent upon the following described stock, on account of Assessment (No. 1) levied on the Fourth day of June, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

NAMES.	NO. CERT.	NO. SH RES.	AMT.
O'Connell, Annie A	18	100	$50 00
" "	19	100	50 00
" "	20	50	25 00
Green, Wm D	26	150	75 00
Eddy, Ina I	15	100	50 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of June, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 10, No. 415 Montgomery street, San Francisco, California, on SATURDAY, this Ninth (9th) day of August, 1890, at the hour of one o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

W. T BAOGETT, Secretary.

Office, Room 10, No. 415 Montgomery street, San Francisco, California.

Educational.

School of Practical, Civil, Mechanical and MINING ENGINEERING,

Surveying, Architecture, Drawing and Assaying

723 MARKET STREET,

The History Building, SAN FRANCISCO, CAL.

A. VAN DER NAILLEN, President.

Assaying of Ores, $25; Bullion and Chlorination Assay, $25; Blowpipe Assay, $10. Full course of assaying, $50.

Send for circular.

The Evans School OF ASSAYING AND CHEMISTRY,

Rooms 46 & 47, 2d Floor Montgomery Bl'k, } 628 Montgomery St. San Francisco,

Also, Evening Classes, 7 to 10 o'clock.

JOHN T. EVANS, M. A., Principal.

HEALD'S

BUSINESS COLLEGE,

24 POST ST., S. F.

FOR SEVENTY-FIVE DOLLARS THIS College instructs in Shorthand, Type Writing, Bookkeeping, Telegraphy, Penmanship, Drawing, all the English branches, and everything pertaining to business, for six full months. We have sixteen teachers, and give individual instruction to all our pupils. Our school has graduates in every part of the State.

SEND FOR CIRCULAR.

C. S. HALEY, Secretary. E. P. HEALD, President.

PRACTICAL

Books on Mining

AND IRRIGATION.

Descriptive Catalogue and Circulars of Books relating to Assaying, Mining, Electricity and Mechanical Engineering, sent free on application.

E. & F. N. SPON, Publishers,

12 Cortlandt St., New York.

HORACE D. RANLETT,

Ores, Mining, and Commission,

420 Montgomery St., S. F.

Ships under advances to smelting works in Boston, New York, Baltimore and Liverpool.

Twenty-one years' experience in Shipping Ores and Managing Mines.

Solicits Consignments of Copper Produce and Management of Mining Matters.

All business conducted on Cash Basis.

Purchase and shipment of Mining Supplies A SPECIALTY.

Sales of Developed Copper Mines undertaken.

Business Manager of UNION COPPER MINE, Copperopolis, Cal.; NEWTON COPPER MINE, Amador Co., Cal.

SAMUEL SPRINGS

EIGHT MILES N. W. FROM

MONTICELLO, NAPA CO., CAL.

Twenty-two miles by daily stage from Winters. Passengers leaving S. F. by morning train reach Springs same day.

Tri-weekly stage from Napa connects at Monticello.

Famed for Stomach Troubles and Impurities of the blood. Water sparkles like champagne and is very pleasant to taste.

TERMS—Room for Tent with use of Water. $1 per week. Tent with use of Water, $2 per week. Single Room in Cottage, $2 per week. Double Room in Cottage, $4 per week. Board and Lodging, $9 per week.

Butter, Eggs, Provisions, Hay, Grain, Wood, etc., for sale on grounds at low prices.

P. D. GRIGSBY,

MONTICELLO, CAL.

DIVIDEND NOTICE.

The German Savings and Loan Society,

526 California Street.

For the half-year ending June 30, 1890, a dividend has been declared at the rate of five and forty-hundredths (5 40-100) per cent per annum on Term Deposits, and four and one-half (4½) per cent per annum on Ordinary Deposits. Payable on and after Tuesday, July 1, 1890.

OEO. TOURNY, Secretary.

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, June 30, 1890. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 33) of One Dollar ($1.00) per share was declared, payable THURSDAY, July 10, 1890, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer Books close July 5, 1890, at 3 o'clock P. M.

ALTON H. CLOUGH, Secretary.

Wanted—In a Quicksilver Mine,

A FIRST-CLASS

MINING FOREMAN

Must understand Timbering and Working Hard or Soft Rock. Address with references,

QUICKSILVER,

Calistoga, Napa County, Cal.

REGAN VAPOR ENGINE.

NO BOILER! NO FIRE! NO STEAM!
Simple, Compact and Cheap.
No Fire or Flame. Started Instantly without Even a Match.
No Ashes! No Explosion! No Engineer!
FULL POWER OBTAINED IMMEDIATELY.
The Moment Engine Ceases to Run, all Expense Stops

NO DANGER.

Horizontal, Upright and Marine Vapor Engines and Launches.

Three fourths to Fifteen Horsepower. From $175 to $1200.

Send for Our Large Illustrated Catelogue.

GEORGE HAAS, 324 Market St., Phelan Building, } SAN FRANCISCO, Feb 21, 1890. }

REGAN VAPOR ENGINE CO.—Gentlemen: The 2 H. P. Engine you put up in our factory last November, has given satisfaction beyond my exoectations. It does my work better than than those two Electric Motors did, with scarcely any expense for gas. I paid the Motor Company $25 per month for power, while the Vapor Engine has cost me but $2 per month so far. But, be it understood, I have not used the Engine as much as in summer, but the cost of motor would have been all the same, making a saving of $69 in three months. I am satisfied the Engine will pay for itself in less than two years. I use it for freezing cream, run three fans, coconaut grater, etc.
Yours truly, GEO. HAAS.

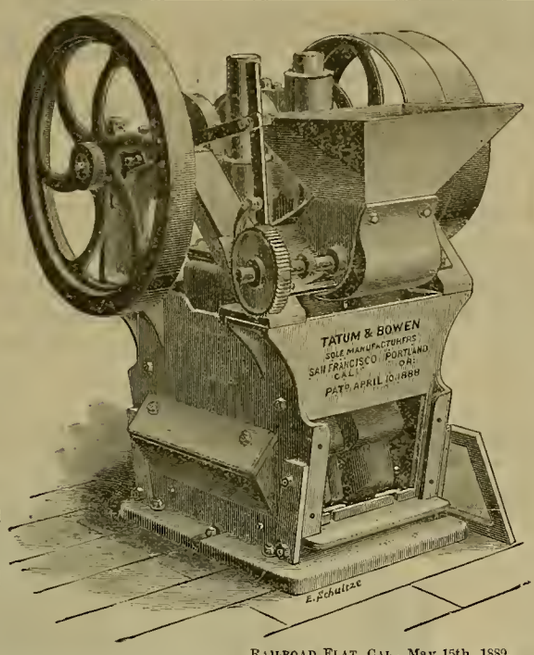
Regan Vapor Launches

The uses for small steamboats and launches are innumerable; they are convenient and serviceable for transportation, and are a source of pleasure for those who are fond of sailing. But many have been deterred from purchasing such boats, because of the trouble and inconvenience of using coal, and the necessity of obtaining a Government license, engineer, etc. Our motor does away with these objections. The small space taken up by our engine in the boat **gives more room**; the boat will seat **twice** as many persons as one the same size fitted up with a steam engine. It takes only **two minutes to get under headway**, and can be stopped when running at full speed within the length of the boat, the reverse motion being instantaneous and effective. We carry in stock six regular sizes of hulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos. Kane & Co., Racine, Wis.

REGAN VAPOR ENGINE CO., 221-223 First St., San Francisco, Cal.

—THE—

PERFECTED DOUBLE Economic Quartz Mill.



Attached to each Mill is an effective

Automatic Ore Feeder.

RAILROAD FLAT, CAL., May 15th, 1889.

MESSRS. TATUM & BOWEN, San Francisco—GENTLEMEN: I have had many inquiries in regard to the performance of your oscillating Stamp Quartz Mill, to all of which I have made substantially the following answer:

That it will crush and discharge through a No. 30 mesh wire screen, 6 tons of average quartz per 24 hours; that, compared with the common stamps, the power required to do the same amount of work is considerably less—the slipping motion of the stamps reducing the ore much faster than the drop alone can; that the discharge is good, and as to amalgamating and saving gold, my experience with it is that it is just about the same as the ordinary battery.

To the above I shall add that the new Automatic Feed attached is a perfect success. It can, in a moment and without stopping, be adjusted to feed just as "high" or "low" as desired, and can be depended upon to supply the stamps with ore exactly as they need it. This is important, as it saves feeding by hand, which cannot be considered at the present day, or the purchase of a high-priced feeder.

Considered as a convenient Mill for prospecting, or for a small mine, it fills the bill.

Yours truly, [Signed] JAS. S. REYNOLDS,
Supt. New York Mine, Railroad Flat.

The Mills as we make them now are Far Superior to the one at the New York Mine.

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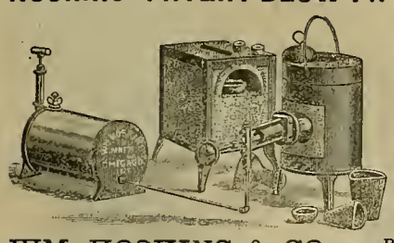

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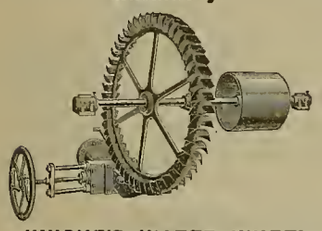

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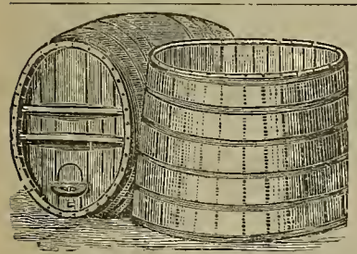

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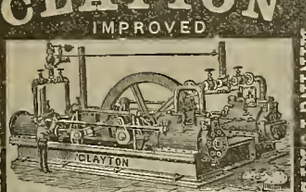

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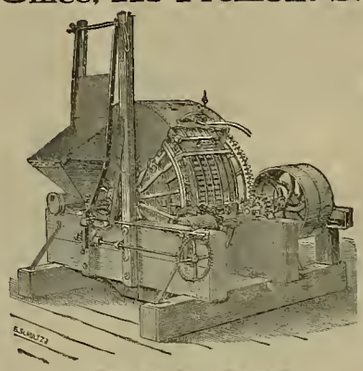

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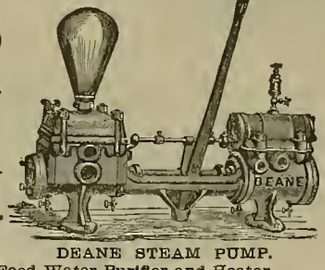

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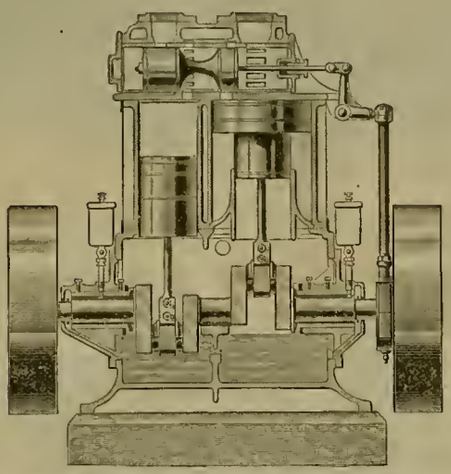

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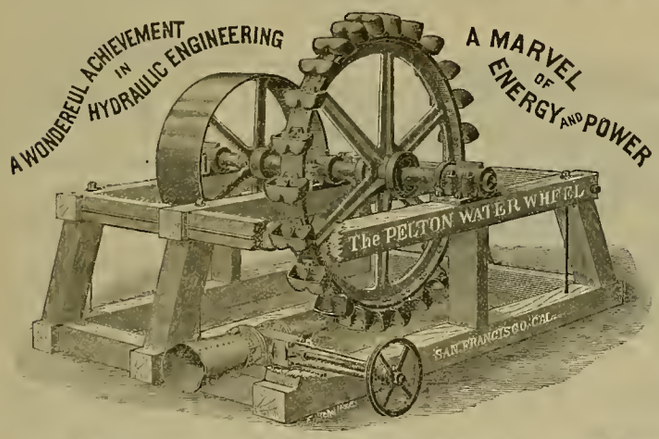
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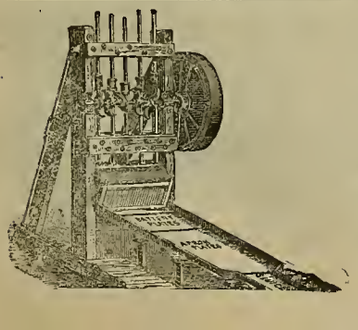

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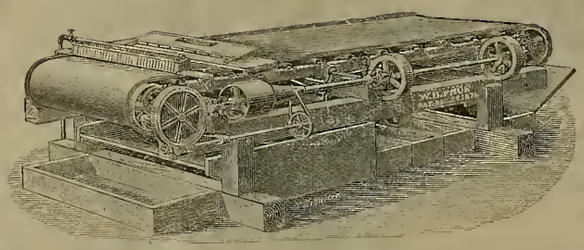

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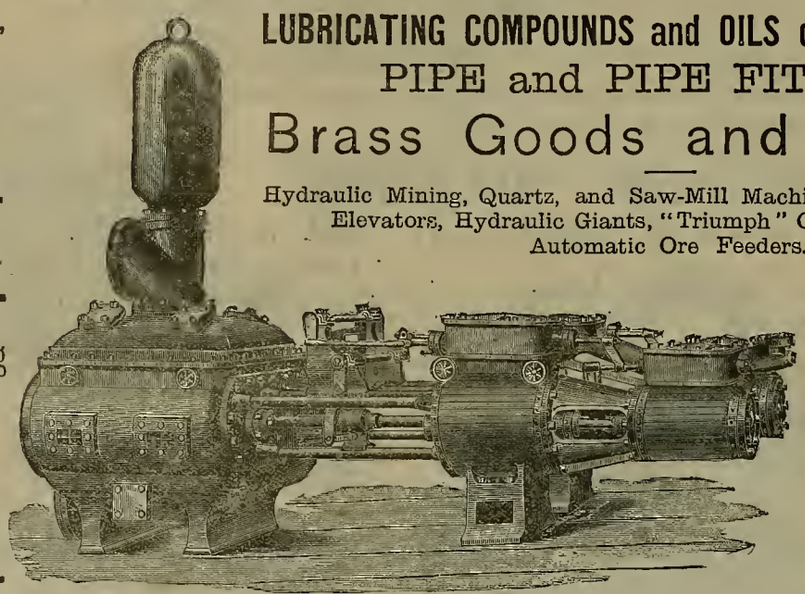

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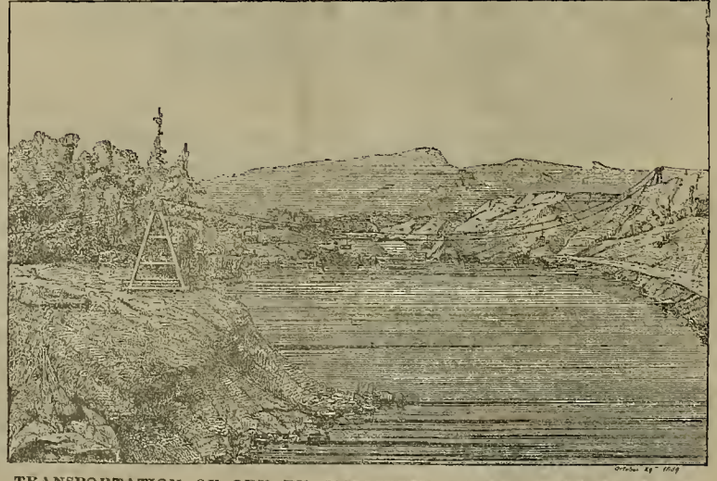

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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SAN FRANCISCO, SATURDAY, JULY 26, 1890.

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Amalgam Strainers.

Bags for straining the mercury are generally made of cotton duck either sewed directly on to an iron ring as in most of the quartz mills in California and Nevada or attached to leather sewed to the ring as in some of the mills in Colorado. At the Bodie mill the bags are made of canton flannel. These bags are 10 to 12 inches in diameter at the top and from 24 to 28 inches long. They often hold as much as 1200 pounds of amalgam. The weight of the mercury is always enough to make a preliminary straining without its being touched. They are set in a hole cut in a table as shown in Fig. 1 or in boxes prepared for the purpose, which were formerly always left open but are now arranged so that they can be locked as is shown in cuts Nos. 2, 3 and 4. These we take with the description from Prof. Egleston's recent work on "The Metallurgy of Gold, Silver and Mercury in the United States."

At Judd & Crosby's mill the mercury is dipped out of the mercury receiver of the settler with a cup once in two days as it accumulates, and the plug drawn once a week to discharge the mercury, which is carried in small pails to the strainer. In the Eureka mill a canvas cloth curtain of the inside diameter of the tub is attached to the under side of the table and all nearly to the bottom of the receptacle, to prevent loss of mercury.

At the Brunswick mill all the mercury and amalgam from the settlers flow into a locked tank called a mercury safe, six feet by four feet and one foot deep, which has six feet of water on the bottom. The excess of mercury flows off by the pipe *a* (Fig. 2) in the side of the bottom of the safe, and is collected in a receiver at a lower mill. At this mill there is one box between every two settlers. The upper part has an opening just large enough for the men to pour in the mercury, but only the amalgamator opens the lid to work the amalgam. When the table (Fig. 1) is used the bags reach down nearly to the bottom of an iron vessel placed on the floor, about 18 inches high and 18 inches in diameter, set inside one 20 inches high and 20 inches in diameter. These safes were formerly made of wood as shown in Fig. 2, but as wood is always objectionable where a large quantity of mercury comes in contact with it, the top and bottom are now made of cast iron, as shown in Figs. 3 and 4. The top of the safe is placed below the siphon discharge of the settler and receives through the opening in the cover all the mercury and amalgam. The amalgam remains on the strainer. The excess of mercury runs through and flows to the mercury collecting-tank. Fig. 3 shows the ordinary safe as now constructed, and Fig. 4 one providing for the mercury, when there is likely to be an excess of it by introducing a side-opening, *a*. All the mercury and amalgam collected in the kettles from the pans and settlers are poured into this canvas strainer, which is filled nearly to the top.

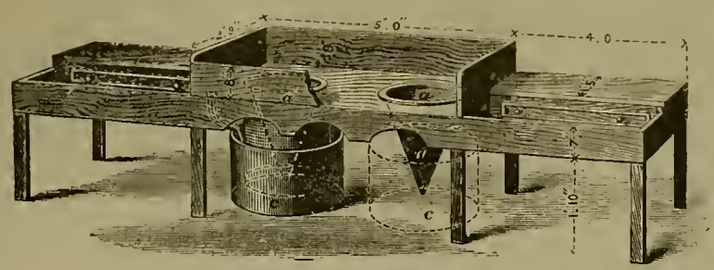

Fig. 1.—TABLE WITH BAGS FOR STRAINING MERCURY.

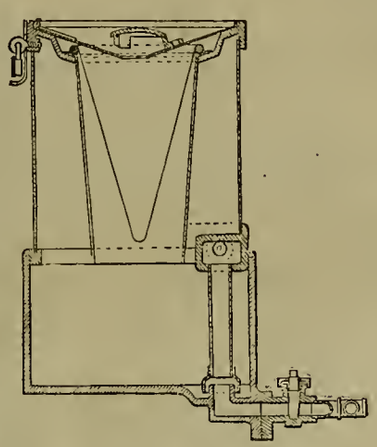

Fig. 4—QUICKSILVER AND AMALGAM SAFE.

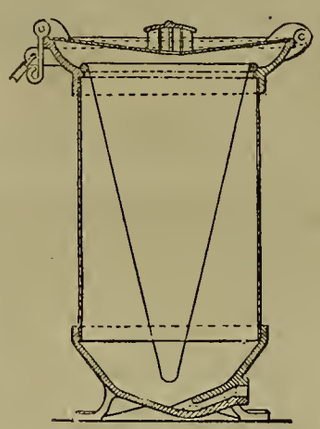

Fig. 3—IRON AMALGAM SAFE.

In some of the Comstock mills, hydraulic strainers with a pressure of 100 to 125 pounds to the square inch are used. They effect a great saving of fuel in the retorting. The ordinary amalgam from the canvas bags contains about seven parts of mercury for one of bullion, that from the press contains only 3½.

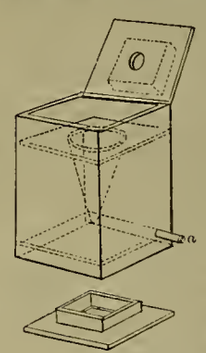

Fig. 2—WOODEN AMALGAM SAFE.

TRAIN-LOAD OF CANNED GOODS.—A. Lusk & Co. shipped a train-load of canned goods East on Wednesday. They expect to ship a full train-load of canned goods each day for the next two months to various parts of the country. This is the first time in the history of the Pacific Coast that canned goods have been sent out in train-loads.

THE MOUNT LYELL GLACIER IN THE SIERRA NEVADA.—See page 56.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Ancient River Channels.

Ralatioua of Aurlfaroua Gravel and Lava.

EDITORS PRESS:—A vaet qnantity of matter hae heen wrltten in worke on geology ahout different epochs in the world'e history and npon the general proposition of the formation of ancient river oourees and channels. I have read a great many articlee npon minee and mining in California and eleewhere, hut there eeeme to he a lack of investigation of the particular gravel channels in which the miner is moet intereeted. It hae heen left almost entirely to the miners' explorations for what ie at present known on the enhject, on account of there being so little done hy scientiete that is of any real value to miners. Nearly each and every one of them has his own particular ideae ae to this and that formation, which leavee everything at the present time in confnslon. Now this ehonld not exiet. Nature does not go in any roundabont way in this work; everything is done in the most eimple manner, and when any of the varione eoientific facts have been learned, we find the work, whateoever it may he, is done in the eimplest manner possible, which, of oonrse, ie the heet.

Graval Mining Juat Commaucing.

We know that mining in California, and, I enppoee, elsewhere, ie in its infancy at the present time. Only those exposed parts of anoient ohannels have heen worked, where the miner with emall meane, or rather no capital except his lahor, hae heen able to carry on his enterprise. Now the aspect has ohanged. The deep, extensive, lava capped channele, nnder ridgee and tahle lands lie then in their fanoied security from the reaoh of the miner's pick and shovel. They can only be reached hy large expenditnree of oapital. They are drift diggings, and their extent is almost without limit. They are continnous and unbroken almost without exception, and when discovered, the employment to labor will he as continuoue as the coal minee of England and America. We all know the hietory of mining towns in California, which spring np almost inetantly and vanieh as quiokly. Thie is on account of the comparatively small extent of the depoeits discovered. Another thing that has given mining (that le, gravel mining) a set-hack ie that it seems that the man who oan tell the moet plauoible story, who has the most imaginative ideas that seem poseible for any one to conoeive, ie the one who is most snoceseful in getting oapital invested. Gravel mining from euch oausee has got a very "black eye." If you approach a man now-a-daye on the subject of investing in gravel mines, he will poeeibly look upon yon as a ecoundrel and trickster. It will come around all right some time, bnt things are, no donbt, in in a very had way at present.

To etart the discuseion on ae reasonable a hasie as is in our power to do, and try not to be so scientifio as to make our disonssion unintelligihle to the average miner and to etrike directly at the point whlch most interests him in hls work:

Definition of a Channal.

First, I would define a primltive river channel as one that wae made after the Sierra Nevadas were formed and hefore a lava flow oame along to fill it np. Now suppoee enoh rivers to he flowing along ae rivers flow to-day. If they oontalned gold it would be on the hottom and in the gravel as it is in onr present rivers—the gravel of the particular character of the strata over which the water flows in ite downward couree to the sea. Now after the river ia all formed and the water peacefully wending ite way down the ohannel, there comes a flow of lava from the ernption of eome voloano, whether lava ash and irregular rock taken np hy the water and carried along until it ohokee itaelf up, or whether mnd from eome fissnre, whether hot or cold or medinm hot or otherwiee. If it moved at all it would naturally flow in the primitive channel. It would hardly flow on top of some ridge; it wonld seek the lowest levels. Thie mass of lava finally solidifies, because we find it very solid now.

Lava.

Now we oome to what follows, and here let me etate that all lava with which we have anything to do contains sllica or one of the constituents of qnartz in very large qnantities, which faot alone renders the lava one of the most powerful reeistante to the action of heat, cold and the aotion of water. Most stratified rocks being less favored in that reepect are more suseoptible to the agenciee of erosion, from which canse we wonld naturally have the bed, or country rook, gradually wearing away much faster, so to speak, than lava iteelf.

Now, knowing theee facts, where should we look for the lines of the cnttinge of the new channels that wonld naturally he cnt by the dieplaced waters of the primitive ohannel? All things being equal It would evidently cnt along the line of least resietanoe whioh would aeeuredly he on either edge of the lava flow when it comee in contaot with the hed or ocuntry rock. The erosion would be generally vertioal, so to speak. The new or seoondary channels would skirt either or both edges of the lava flow. Now what kind of gravel wonld these seoondary channels naturally contain hut gravel of the character of the ocuntry rook passed over, with a large portion of lava gravel or bowldere? Thie last feature is a very valuable characteristic in determining the class of channele to whioh it belonga. Now, suppose after these secondary channels are formed there oomes

A Secoud Lava Flow,

Would not the oonrse of the second flow be along theee secondary ohannele? A fine example of theee eeoondary ohannels, lava-capped, may he fonnd on the Mooreville ridge, in Plnmae and Botte counties, a eharp ridge of grayieh lava ash in the center, with a platean of haealt ekirting it on either edge. The eame formation of different sete of channels goee on, correeponding to different lava flowe, all the eeoondary ohannels containing large qnantities of lava gravel.

Near Dogtown, in Butte oonnty, there are as many as five or six separate flows of lava, with as many different eets of channels. Occasionally we meet with channels where there has heen hut one flow of lava and the seoondary or parallel ohannele stand ae benches along adjaoent to the lava. Bnt where there ie no lava cap, the erosion hae left the channel only in epote, the bowlder deposit partially acting as a protector in place of the lava oap. The most important channels of the second class are

The Quartz Graval Chaunals,

Called so from the fact that they contain very little, lf anything, but qnartz gravel in the ohannel. There ie a very wide difference of opinion among minere as to the age of these qnartz gravel depoeits. One thing eeems to be certain—that is, that we may find lava without any quartz gravel, hut if we find any qnartz gravel we are certain to find lava in the immediate vicinity. This I ehonld say was a very important factor in determining thelr age. The lava has not followed the gravel, but the gravel skirte the lava nearly everywhere. If the lava followed the gravel, it would be today oapping the channels. The deepest or thickest lava would be over the center line of the quartz gravel deposit. But such is not the oaee. We usnally find the deepeet lava to one side of the quartz gravel. Thie may he eeen at La Porte, Plnmae county, where the lava nnder the Gihsonville ridge is mnch deeper than the hed of the qnartz ohannel. The only explanation that miners give is that the lava raieed up from the bowels of the earth and cut the channel off. Snoh an occurrence is possihle, but is highly improhahle.

The Grada

Of these qnartz ohannele oorresponds very nearly with the general grade of the adjaoent lava ridgee or tahle-lands. The reason of their containing almost exclusively quartz gravel is merely a matter of coujecture, but from the fact of their invariahle aeeociation with lava rock the qnartz is probahly from deposits of alkaline waters hlghly charged wlth silica from the lava. The most complete example of a quartz channel may he seen at Poverty Hill, Sierra oounty, in the claim of Kingdon & Judson, both rims heing exposed to view and ita couree easlly traced.

Pipe-Clay.

One very characterletio feature of these seoondary ohannele, whether lava-capped or not, is the quantity of "pipe-olay" they oontain, something very seldom, if ever, fonnd in a primitive channel in a mountainons conntry. A good example of the primitive ohannels may be seen at the Perschbacker and Indian Spring mines at Dogtown, Butte oonnty. There are a great many pointe in detail that might he shown to dietingnish these various olaeeee of leeds, but they would make the article too long. With your permieelon I will present in the near future a plan for the reeumption of hydranlio mining without injory to the rivers and lowlands.

MINER.

Oroville, Butte Co.

Vipond District, Montana.

EDITORS PRESS:—The mining property of Joseph Stnrm is under bond and lease to S. A. Barbonr, snperintendent of the Hecla mince, and H. T. Sappington of the Hecla Mercantile and Banking Oo. of Glendale.

The property is bonded for $8000, with $800 forfeit, and expires in eix months. A force of miners is being put to work to develop the property. In case of forfeiture of the bond Messrs. Barhour and Sappington receive half the ore extracted and half that already on the dnmp.

The "Lone Pine Oo." are abont to secnre the mines owned by Vipond Brothers and Joe A. Browne, and the sale is considered almost snre. We are informed that a heavy forfeit will be required.

Other partiee are very earnestly endeavoring to secure the "Faithful" mine by hond and leaee.

Should these three salee he conanmmated it will he a new era in the Vipond mining district, as all the veins are large and are now developed hevond the proepecting etage, while the three different companiee taking hold of them are all etrong and mean hnsiness.

B.

Glendale, Montana.

THE salt farms at the Great Salt Lake, Utah, made laet year 40,000 tons of aalt, of which 36,000 tons were ueed by the silver mills of Utah, Idaho and Montana.

SPOKANE FALLS, Washington, now has a mining stock exchange with 100 members.

The Gold Belt of Northern California.

Anciant Rivar Channals and Graval Daposita.

NUMBER VII.

[Written for the MINING AND SCIENTIFIC PRESS by JAMES F. TALBOTT, Blue Canyon, Placer Co.]

The North Fork divide system of gravel deposite in the gold helt extende from the South Yuba on the north to the North Fork of the American on the south, are formed hv the eame method ae thoea on the Middle Fork divide, and like them, have a common source.

Owing to the peculiar topography and formation of the Nevada ridge, eome of the gravel deposits from north to eouth, are many miles apart. The ohannel down this ridge, operating as a vaet natnral gronnd elnice, has dnmped its tailinge at the lower end ahout Nevada City and Grass Valley, and like a modern ground sluice when hlocked np in one place, the tailings find an ontlet at some other point, and thue all of the deposits on the ridge were formed.

On the north side of the South Yuha, eome distance below Onega, is an extensive gravel depoeit at Relief Hill, whioh belongs to the Moore's Flat and North Bloomfield syetem, and is not conneoted with this.

It hae been definitely shown heretofore, that the ohannel in the Shady Run ridge extends from Bogns Point to Bear Valley, and from Bear Valley through the ridge to Diamond oreek ie hnt little more then two miles, thus showing the oonneotion of the two ohannels ahout this point, and as a consequenoe, the common source of the gravel in the two ridges, and if the sonroe of the gravel, it mnst be of the gold fonnd in it.

The minute deecription of the Shady Rnn ridge wae, firet to show the source of the gold in the Dutoh Flat and Gold Run mines, and seoondly to show the certainty of rioh drift mines in the ridge, under the lava cap, the direot source from which all of the gold in this basin oame.

Gravel Dapoaita.

There are but few gravel deposits from the Shady Run ridge, prohably owing to the narrow and oonfined ohannel, whioh was rapidly filled. The principal depoeit on the weet ie that at Dutch Flat and Gold Run, which is very exteneive, commencing at Indiana Hill on the sonth, extending north and eaet ahont six milee to the upper or east end of the town of Dutoh Flat, where it ie cut off hy Bear river, hut appears to have been ountinuous np Bear river three or four miles farther, and at eome time connected with Elmore, Liberty and Lowell Hills. The main deposit of Gold Rnn and Dutoh Flat is an irregnlar basin, snrronnded on all sides hy high bedrock, exoept on the northeast at the inlet up Bear river, an outlet at Thompson's Hill on the weet into Bear river, and an ontlet at Indiana Hill on the sonth into the North Fork. The method by whloh this basin was formed, and subsequently filled up, ie accounted for in the following way, that a small lateral tribntary, unobetructed with lave, formed a junction with the main ancient river below Bogus Point, ahout Indiana Hill, and that the lava flow in the ridge at Bogns Point then extended down to or helow this junction, therehy forming a oomplete dam at thie outlet, whioh held back all of the detritue and material bronght down hy the floode from above.

The source of thie tributary being in the section of conntry above Dutoh Flat, when thoee breake oconrred at the Hogshack, on Canyon creek and Bear river, the flood waters from them followed the couree of thls tributary.

A Flood.

The gravel and detritue brought down from thoee breake and the periodical floods in time filled thie basin in places to a depth of 300 feet. The indioations are, that ahout the time the oonntry wae all filled up with this deposit from Indiana Hill to Dutch Flat, an extreme high flood occurred, probahly caneed hy one of those extensive breaks from the ridge above. This flood, ooming down with a great rush, broke through on the sonth at Indiana Hill, swept the lava and main channel away as far up as Bogne Point, and cut out Canyon creek between the gravel deposit and the lava-capped ridge, leaving everything on this eide abont ae we eee it to-day; while on the other eide to the north, theee flood-waters broke thronph the west rlm and cnt down an outlet at Thompson Hill, which left the condition of the Dutoh Flat portion more of a channel than a hasin. From Indiana Hill to the Dutch Flat minee, nearly three miles, the grade of the hedrock risee about 40 feet per mile. From the curve at Dutch Flat to the eaet the grade is more than 200 feet to the mile. These figures are obtained from actnal workings and snrvey At Indiana Hill the outlet chenuel ie not moro than 50 feet wide, with eteep-rising hedrook on either side several hundred feet high. From this point going north, the depoeit gradually widens till it attaine a width of a mile or more, where the C. P. R. R. orosees it. Thie is the Gold Rnn portion. The Dutoh Flat portion has an average width of ahont half a mile. At Indlana Hill the depoeit is emall gravel, oobble, and here and there a good-sized quartz howlder on the hedrock. Going north, in the Gold Run portion, the fine gravel on top attaine a depth of from 100 to 200 feet, interspersed in places with strata of sand and pipe-olay. Continning on into the Dutch Flat portion, the fine top depoeit decreasea in depth, till at the upper or east end of the town on the sonth rim it is only a few feet deep on top of the underlying maee of howlders. In the Dutch Flat portion the bottom deposit increases ae the top decreases, in depth, till the bottom to the depth of from 100 to 200 feet, ie snch a maes and jam of howlders there is but little spaoe for the fine gravel.

The Dutch Flat Depoalt.

As heretofore stated, the north and east part of the Dotch Flat portion of the depoeit, at the present time, has more the appearance of a channel thau a basin, as is indioated hy the high rim on the south and a oontinnous rim on the north, from the outlet on the west, along up Bear river to where the depoait is out off hy the course of the present river. For ages the flood waters ran through this channel and outlet to the west, until a heavy slide, or vast rnsh oame down and blooked up the narrow inlet, and turned Bear river into its present ohannel outside the gravel deposit. Positive evidences of this slide, or rush, are seen from the Polar Star and Southern Cross claims, all the way above, whloh show this inlet was suddenly blocked up, where masses of float bedrock, hnge, angular bowlders, chnnks of lava and all kinds of debrie are jammed together in a oonfused mase, but slightly washed or rounded by the action of water. It is posaible that when the lava dam at Bear valley was carried away, the vaet flood which followed, and out out the gorge for Bear river above—covered up the old channel below Dry creek, with 40 feet of debris, and swept away the gravel deposit that once connected Liberty and Elmore hills with Dutch Flat, blocked up this inlet and gave direction here to Bear river in its present channel. From the line of faote here presented, it is obvious this great gravel depoeit has oome from the ohannel in the Shady Run ridge, through the breake indicated, in conoection with that from the Nevada ridge through the hreak at Lowell hill. And what has heretofore been oonsidered the hub of all the mines in thie seotion of the gold belt, is hut an immense dumping gronnd (as are all of the exteneive gravel depoelts of thie character) for the debris and tailinge of the vast natural gronnd sluices whioh head in the ancient channels heneath the lava-capped ridges.

In the absence of any data on the snbjsct, some views expressed in accounting for certain exieting conditione, may seem somewhat speculative. Bat whether correct or not, the conditions and facts remain all the same, and must he accounted for in accord with the operation of universal natural laws. There is no mystery ahont it.

Tha Hydraulic Minaa.

The hydraulic mines of Gold Run and Dutch Flat are among the leading ones of thie olass in the State in richness and extent. Many millions of gold have heen taken ont of these mines, and millione remain buried in the hottom depoeit that ehonld be taken out and put in circulation. From the character of material and method of depoelt, those minee oan he worked now in no way but hy the hydraulio proces, with the improved appliances and giant powder. Many of the miners thonght good drift minee conld be opened ont, after the hydraulic mining was stopped. A great deal of prospecting has heen done, with no satisfactory reeulte. After getting back a certain distance, it ie fonnd the gold ie commingled all through the depoeit, and not concentrated on the bottom any place as it was on the ontside at some points. In early daye of mining here, the idea prevailed that a rich ohannel ran through from Indiana Hill to Thompeon Hill at Dutch Flat. In the spriog of 1852, I discovered Indiana Hill (the firet diggings struck hetween the North Fork and Bear river). My company worked the outlet channel from the break-off, abont 400 feet hack, where the gold was largely concentrated. In the eeason of 1853-54, having water ahout five months, with six men we took out $25,000 hy the old process of ground sluice, pick and shovel. While, the eame seaeon, the company adjoining us hack in the hill, working the eame way, harely made wages above their water hill (water sold for $1 per inch).

Shortly after the discovery at Indiana Hill the strike was made at Thompeon Hill, which originated the idea that a rich ohannel ran from Indiana Hill north to Dutoh Flat and Little York. The ontlet channel at Thompson Hill proved to be ahont the same as that at Indiana Hill, except in the former there was a heavy depoeit of hig howlders, and the rich pay extended farther hack into the depoeit. Subsequent workinge ehow that there is no snch channel. If there were, eeveral hundred miners wonld be working on it to-day in the richest drift mines in the State. It is evident, then, that this ie exclusively hydranlic gronnd and can be worked in no other way.

Equalizing Gradaa.

Let any commission examine the conditions here, and from the charaoter of the materiale and the forcee hy whioh it must have been deposeited, it will be apparent what a vast quantity of debrie can he held hack by some permanent obetruction. The conditions indicate that, in the first etages of the deposit, the high floode that swept over the steep grade in the Dutch Flat portion did not oarry the howlders and heavy hottom material as far as Indiana Hill, a distance of five milee. Then each anoceeding flood hullt up and widened the depoeit, thereby lessening the grade eo that the same flood force would not carry the heavy material as far as the preceding one, the lighter material being carried ahead and deposited on the top. By this method, the grade has become eqnalized

and the deposit leveled up, the heavy bottom material increasing and the lighter top decreasing in depth as the head or source is approached. A large percentage of this fine top gravel deposit appears to be of modern make, probably having its source from the big slides that occurred during the modern erosions, which are not likely to recur. It will be particularly observed here that nearly all of this fine gravel and light material on top has been washed off in former years with the old hydraulic appliances, that would be useless now on the bottom deposit of bowlders and hard, heavy material, which can be easily worked by the improved methods.

By adapting the principles involved in the natural method of deposit, as observed here, a location could be selected on the North Fork, where a permanent dam could be constructed that would retain every foot of the heavy bottom material of this extensive deposit, within the limits of ten miles from the dump; and all the lighter material passing the dam would affect the navigable streams but little, if any more than the natural wash from the plowed lands on the big ranches in a high flood season.

Protecting the Miner.

There is a great deal of talk about protection. If there is anything in this country that needs protection it is the great mining industry. Not protection from foreign pauper labor but from the Government itself. The present policy adopted by it is a monstrous wrong to an industrious class of its citizens. By a decree of its courts, they are deprived of the right to use their own rightfully acquired property. And if extended to the extreme limit, the principles laid down as a precedent by the courts to be followed for centuries regardless of changed conditions. If one class can be restrained, others can be where the results differ only in degree.

The drift and quartz miners loosen the material hundreds of feet beneath the surface, and the rancher loosens it on the surface, and it is all carried into the rivers alike. What is the difference whether the material is loosened with the pick or the plow? The Government infringes on right and justice by appropriating the public money to be used against a legitimate industry, and by its birelings in hunting down as outlaws and moonshiners a law-abiding class of its citizens. It has reversed the great republican principle upon which it was established—"the greatest good to the greatest number." It need to be the almighty *silver* dollar, now it is the snoreme $20 gold piece that moves the world. Gold is an actual necessery of life to the State, the nation and the mercantile world. Here then are millions directly interested, besides those engaged in its production, on the one side, who are to be deprived of this necessary of life, so that a few individuals in a comparatively small locality on the other side may enjoy the privilege of raising a few tons of wheat and potatoes.

To think this great mining industry has no protection—no recognized rights in our statute; an industry that sent out its product in hundreds of millions of gold, which sustained the credit and possibly preserved a united government. The Government should aid and protect the industry that laid the foundation and built up a prosperous State, that shines a bright, golden star in the firmament of her sister States.

The Great Blue Lead.

The "Great Blue Lead," according to all the writers and talkers, is found in most all of the mines as a separate and distinct lead or deposit and wherever found is invariably rich. None of them, so far as we know, have attempted to give any idea in regard to its source or account for its reputed exclusive richness. Running north and south through Nevada and Placer counties about on the course of the bedrock, near the township line between townships Ranges 10 and 11 East, and just above most of the extensive gravel deposits along here, is an extensive belt of serpentine formation from one to three miles in width. On the Middle Fork divide, the Brimstone plains is a prominent point on this formation.

As a natural result this formation gives character to the deposit below. We accordingly find this peculiar deposit of blue gravel in all of the deposits below, or to the west of the Serpentine, whereas it is not found above or east of it, which is also corroborative proof of the course of the ancient channels.

In the locality of Gold Run and Dutch Flat, just below the western border of the Serpentine, is an extensive body of this blue cemented gravel, which has been worked on and opened out, so that it can be traced continuously from Indiana hill to the upper end of the Dutch Flat portion of the deposit. The blue gravel here, as in all other localities in proximity to the Serpentine, forms the bottom strata on the bedrock, and the extent depends on the forces operating and the length of time continued, just the same as in all other deposits.

(To be Continued.)

MRS. C. W. BRICE offers the sum of $6000 in aid of astronomical research this year. The sum will be divided, and, in general, the amount devoted to a single object will not exceed $500. Precedence will be given to institutions and individuals whose work is already known through their publications. Applications are invited from astronomers of all countries, and should be made to Prof. Pickering of Harvard College, before Oct. 1, 1890, giving complete information regarding the discovered objects.

San Bernardino County.

Its Mineral and Other Resources.

NUMBER III.

[Written for the PRESS by JAMES H. CROSSMAN.]

Colton

Is an incorporated city, laying at an elevation of 976 feet. It contains about 1200 inhabitants, and is situated at the junction of two transcontinental lines of railroad, the Southern Pacific and the Santa Fe. The city is about three miles distant from the city of San Bernardino, with which it is connected with the California Southern and a motor railroad. Colton is a modern-built city of growing importance, and a rival of San Bernardino to the extent of bidding for the county seat when the new court house is ordered to be built. The business portion contains many substantial buildings of brick, marble, stone, cement and wood, of modern architecture, and many beautiful residences surrounded by luxurious gardens and lawns adorn the suburban streets. Handsome churches and commodious school buildings add to the attractions of the place. Banks and well-arranged hotels, together with a well-kept public park filled with semi-tropical flowers and shrubbery, give to the place an air of refinement and prosperity. The town is abundantly supplied with water, and the streets are broad and systematically laid out. The principal buildings consist of the Union and Gilbert and First National Bank blocks, Transcontinental and Marlborough hotels, new city hall, etc. The leading business house, the Colton cannery, employs 300 hands. There is a lumber-mill, pipe-works, feed-mill, brick-works, etc. From Slover mountain, three-quarters of a mile from town, large quantities of lime and marble are being extracted and shipped by rail to a market. Large quantities of fruit are grown, gathered, canned and shipped from this place. This town is steadily increasing in population, and bids fair in the near future of becoming one of California's most promising inland towns.

Ontario.

Owned by the Ontario Land Co., is worthy of note as the "Athens" of San Bernardino, with its college and schoolhouses, and the famous Euclid avenue and gravity street car. About 3000 acres of land are under cultivation and producing principally citrus fruits. Over 100 tons of raisins were shipped from this locality last fall and an evaporating establishment is in process of construction for handling deciduous fruits. The soil and climate are particularly adapted to the growth of oranges, lemons and prunes. The Santa Fe railroad crosses the colony.

Chino,

With a population of 200, is situated a few miles north of this town. A narrow gauge railroad connects with the Southern Pacific. The town boasts of a hotel, bank, stores, and a newspaper. Richard Gird, Esq., is the master spirit.

Banning

Is situated in San Gorgonia pass and located on the dividing line between fertility and sterility. The soil to the westward is fertile and productive; easterly, barren and sandy, it being on the borders of the desert; westerly, a luxuriant growth of vegetation; barley, wheat and fruit is seen, the latter of excellent flavor; while easterly nothing meets the eye but a sandy waste of desolation as far as can be seen. Banning has acquired quite a reputation as a sanitarium, particularly for invalids afflicted with pulmonary or bronchial diseases, which is undoubtedly owing to the dryness and purity of the atmosphere. The town supports a good hotel, churches and a school, as well as a weekly newspaper. The elevation of this place is 2000 feet, and the population numbers 600.

Beaumont,

Formerly known as San Gorgonia, is situated on the San Gorgonia Pass and contains many handsome buildings and a fine hotel. It is a flourishing town of 500 people, and a trade center for a large population of thriving and prosperous farmers in the valley. The Southern Pacific railroad passes directly through the town. Beaumont, like Banning, is noted as a health resort.

From San Bernardino we cross the summit of the San Bernardino range through Cajon Pass at an elevation of 3819 feet, entering the desert at Hesperia, a paper town, with its deserted, unfinished and unoccupied buildings; elevation, 3184. We descend into the Mojave desert proper and reach

Victor.

Altitude 2713; population 150; situated on the Mojave river. It is on the line of the California Southern railroad, 40 miles northerly from San Bernardino, 20 miles southwesterly from the Ord mountain and the mining district of that name. Victor forms a trade center and supply point for Holcomb and Bear Valley mining districts, Morongo district, North Central, Galena Camp and West camps of Silver mining district; also for Old Woman Spring district, for the Side Winder and other mines in the vicinity.

In the immediate vicinity of the town are two extensive granite quarries which are in constant operation, the rock finding a ready market in the southern portion of the State. The town contains two general merchandise stores, two stables, feed-yard, blacksmith shop, schoolhouse and church. The owner of the town site being strictly a prohibitionist, no intoxicating liquors are sold within its limits.

Oro Grande

Is on the banks of the Mojave river, 45 miles northerly from San Bernardino. It has 150 inhabitants and is a station on the California Southern railroad and forms a distributing and supply point for a large area of the surrounding mineral regions, farmers and ranchmen who cultivate land that lies on the borders of the river. There are lime quarries in operation in the vicinity, the product of which is forwarded by rail to San Bernardino and Los Angeles, Arizona and Lower California. Two large double patent kilns are in constant operation, giving employment to quite a number of men. The adjacent foothills and low ranges of mountains within a radius of from 10 to 12 miles have long been known to contain large and valuable veins containing the ores of gold, silver and lead, which, owing to their accompanying bases, rendered them so rebellious that they could not be profitably reduced by the free-milling process. A modern ten-stamp mill was erected on the banks of the river, using its water for power to reduce these ores. It proved a failure, notwithstanding the richness of the ore, and the mill now lies idle. It is reported, however, that a 50-ton smelter is in process of construction, which, with the rich silver-lead ores in the vicinity as a flux, will soon remedy the evil and give employment to a large number of men. The town contains the usual number of hotels, supply stores, stables, blacksmith and wagon shops, with a neat church and schoolhouse. Many small, well-cultivated farms surround the town. A ditch from the Mojave river carrying 1500 inches of water affords 30 feet of pressure head at the outlet for machinery purpose.

Barstow.

The elevation of this place above tide-water is 2105 feet. It is situated at the junction of the Atlantic and Pacific, with the California Southern railroad on the Mojave river. It is a thriving business town and contains about 100 inhabitants. There is a large and commodious railroad hotel and eating-house, a well-built depot, round-house and repair shop, and several restaurants and supply stores, which have a good local trade. Water is easily obtained from the Mojave river upon whose southerly banks the town is situated. There are quite a number of silver-lead mines in the vicinity that would be tributary to this point, should reduction works be erected. A survey line has been run from the present terminus of the Utah Southern to this place, for the purpose of forming a junction with the A. & P. R. R. Should this road be completed there could be no better locality for an extensive smelting plant to be established on the same principle as that of Hill's in Colorado. In that event the Carson & Colorado R. R. would form a junction with the U. S. R. R. at Leach's Point, in the desert, and as a feeder supply the main trunk. This line of road would pass through the heart of the desert regions of San Bernardino, which we have in brief, and will show in detail possesses immense stores of mineral wealth.

Daggett

(Altitude, 2002; population, 250) is situated at a point near the Mojave river, 85 miles northerly from the city of San Bernardino, on the line of the Atlantic & Pacific R. R., which forms a junction with the California Southern at Barstow, and with the Southern Pacific at Mojave. It is the receiving and distributing point for that immense area of desert mineral land that lays to the north, east and west. The silver and borate mines of Calico are celebrated for their richness. These mines are practically inexhaustible, and form the Comstock of the desert regions. Ord Mountain, with copper and gold, the lava beds of silver-lead and silver, Alvord, Solo, Silver Lake, Resting Springs districts and, in fact, the whole of the southern portion of the Death Valley region, are at present tributary to this town, it being the terminal point from which mail matter is made up and distributed to the numerous interior post-offices. Among the most prominent of Daggett's enterprising men is J. B. Osborne. To him is due the credit of having accomplished more toward the development of the mines in the desert region, than any other man in the southern portion of the State. He is a large mine-owner, a heavy operator and an inventor of no small capacity. Seeing the necessity for means of transportation over the barren and sandy waste of this desert region, other than by freight trains, he has recently invented a "self-propelling wagon" for transporting ores and supplies to and from such mining property as is remote from railroad facilities, thereby avoiding the necessity and heavy expense attendant upon the employment of mule teams. This steam wagon, at an early date, will be in full operation. The commission and forwarding house of Earl & Co. are an omnipresent figure, and form an important adjunct to the business portion of this as well as all frontier towns and mining camps in the State. Postmaster and County Supervisor J. A. Johnson, in addition to his duties of receiving and distributing the mail, administers the solid necessaries of life to a large area of the surrounding mining country from a varied and extensive stock of goods. Twaddle & Pueltz are also numbered among the live business men of this thriving town, carrying a large and extensive assortment of goods. There are in addition two other supply stores and first-class hotels, two wagon and blacksmith shops, two livery stables, a schoolhouse, a wholesale and retail butchering establishment, four saloons, drug store, town hall, etc., that go to the make-up of a first-class country town. Large quantities of crude borax are daily shipped from this point, the product of the celebrated mines of Coleman & Co., in the Calico mountains, 12 miles northerly from the railroad. Between this place and the Needles, on the Colorado river, there are 17 stations or section-houses on the line of the A. & P. R. R., but as trade centers they are of little importance.

Calico

Is situated in the Calico range of mountains seven miles in a northerly direction from Daggett. It has a population of 300. The discovery of silver in 1881 attracted a crowd of prospectors and adventurers. Its growth, however, at first was slow, as but little confidence was placed in the permanence of the mines and stability of the camp. The ores, though rich, free-milling and in abundance, were believed by many to be blanket ledges that did not "go to the deep." The work of development was done with that understanding, but soon confidence was restored by deeper explorations and the ores found in place and in vein-shaped fissures. In 1882, the town rapidly increased in size and population. Corner lots were in demand; business buildings and residences were erected with the usual accompaniments of all frontier prosperous mining towns. The population at that time numbered 800 to 1000.

Fortunes were realized and as rapidly lost. The fire fiend since that has attacked the town several times. The last fire of importance occoured in 1888, leaving the Calico a black smoking mass of ruins. It is now being rebuilt in a more substantial manner. The material in use is a natural cement and coarse rock forming a grit that is found in the vicinity, rendering it perfectly fire-proof. Cut stone is also used for fronts. Judge Walsh, Ex-Governor John Daggett, W. H. Stow, Dr. A. R. Rhea, Robert Gribben, J. W. Gashwiler, H. B. Stevens, H. R. Gregory, Col. H. H. Markham, William Raymond, John S. Doe and others were, in its days of prosperity, identified with its interests and many of them still remain. It is estimated that during the past nine years the yield of the mines of Calico Mountain has been at least $10,000,000, and it is still largely productive. A noted feature of this camp is that capital has never lent a helping hand. The mines have paid for their own development with large surplus as dividends.

The town at date contains five general merchandise and variety stores, four saloons, three lodging-houses, three livery stables.

Bagdad

Is a station on the line of the Atlantic & Pacific R. R., and contains a population of about 50 with a surrounding country rich in mineral wealth. The ores of gold, silver and copper abound, but the absence of water and the lack of fuel prevents developments.

Needles

Is directly tributary to California for its supplies. Being situated on the banks of the Colorado river, it is doubly favored by not only having the advantages of water transportation by a regular line of steamers on the Colorado river but railroad facilities as well. The Atlantic & Pacific railroad of the Atchison, Topeka & Santa Fe system passes through this town, and since its completion it has had a rapid growth. The population at date numbers over 600 souls. It contains several public buildings, church, schoolhouse, public hall, six variety and one merchandise store, residences and last but not least, a weekly newspaper edited and published by its proprietor, Dr. J. P. Booth. An extensive area of valuable mineral country is tributary to this town. In a westerly direction large bodies of low-grade silver-lead ores in the form of carbonates and oxides abound; while a strip several miles in width and 40 miles in length bordering the river is rich in silver and gold, on which several mineral districts have been formed. The town is destined at no distant day to be a place of considerable importance. Messrs. Monahan & Murphy are the leading spirits of the town, and have contributed largely to its growth.

(To be Continued.)

THE NORTH BLOOMFIELD MINING CO. has given notice of intention to enjoin the Sheriff's sale of its property on the judgment obtained by the county of Yuba against it for the non-payment of a fine imposed upon the company for violating an injunction to restrain it from mining by the hydraulic process. The company contends that its property cannot be sold under a judgment obtained in that manner.

PASTEUR'S TREATMENT.—In the past three years Pasteur treated 7893 persons bitten by mad dogs and only 53 died. The usual percentage of deaths is 15 90, so that Pasteur would seem to have saved 1265 lives.

THE United States Branch Mint, in this city, is again open for the receipt of bullion, the annual settlement having been made.

A LEDGE showing a little gold has been found in Murray township, Alameda county.

THE Drum Lummon mine, Montana, is making a profit of about $40,000 a month.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alameda.

MANGANESE.—Livermore *Herald*, July 17: The first carload of manganese from the Hayes mine on Corral Hollow creek went to the city from Ellis station yesterday. The ore will he shipped for the present at the rate of two carloads a week. This output will he increased soon. Three men are now employed at the mine, and three in hauling ore. A gentleman named McClaren of Oakland has purchased of J. W. Hampton and J. P. Smith the latter's manganese claim on the east side of Corral Hollow creek, ahout three miles above the Eureka coal mine. We understand that the purchaser has let to J. W. Merchant a contract to build a road down to the creek, and up the Lawlor ridge road, and haul out to Livermore 100 tons of ore. Also that work will he begun ahout the first of August.

CHROME.—Two men are now employed at each of the three Chrome mines on Cedar mountain.

Amador.

VOLCANO GRAVEL.—Amador *Ledger*, July 19 C. H. Hoffman, president of the Volcano Gold Gravel Mining Co., came down from Volcano Tuesday. They have just finished cleaning up on the tunnel company's claim. The output fell short of anticipations, although we understand an improvement upon past years. There is quite a stir in San Francisco, especially among the wholesale merchants, in regard to the Clinton Con. property. Many of these business men have taken stock in this venture. A company store is being erected on the ground, for the convenience of employes and settlers. The contract to sink the north shaft of the Kennedy 300 feet deeper, has heen let to a party of nine miners. They are making rapid progress. In one week they put in five sets of timher, representing 25 feet of sinking. The ten-stamp mill on the McKenzie mine near Clinton is expected to start up early next week.

SUTTER CREEK.—Sinking at the Nortb Star is rapidly drawing to a close. They have reached a depth of 940 feet, leaving only about 60 feet to sink, when drifting will be commenced. In all probability this will be the end of sinking, unless something is encountered in drifting. A thorough exploration by drifting, however, will be undertaken before the property will be given up, and it is expected that nearly a year will elapse before they will be satisfied. The miners at the Rose mine are laying off for a few days, on account of striking water and not having the hoisting machinery in running order yet. In a few days, however, everything will he in position, and the water taken out by means of buckets. Superintendent Poundstone is resolved to pursue a conservative course in regard to this mine, and will give it a thorough prospecting hefore taking any steps toward the erection of a mill. The Lincoln is running along in its usual way. The mill is kept running steadily and the ore is reported to be of fair quality.

Calaveras.

MURPHY'S.—Cor. Calaveras *Prospect*, July 16: Mining matters never looked in a more healthy condition than at present, and it would seem as if success is assured to at least two mines in our midst. Bonds have been given to two parties of mines in this neighhorhood, and work on them will soon commence. Prospecting has been renewed, and a more active interest is noticeable on all sides in mining enterprises. A rich gravel strike is reported in the Cataract & Wide West mine in Eho, on the Stanislaus. Work has heen stopped in the tunnels, it is said to secure control of the property. The Total Wreck mill is completed, and is now running on quartz taken from the hottom of the shaft, about 150 feet deep. Another hoiler was added recently to the one at the shaft, and no difficulty is now anticipated in sinking to a great depth. The splendid mill, now in course of construction on the Norfolk mine, is nearing completion. In a few weeks its 15 stamps and two Tustin pulverizers will be heard pulverizing Norfolk quartz.

THE SPINOLLA.—Messrs. Agostini, Spinolla and Gamas are engaged in removing machinery from the Ilex mine to their mining property, as above. Their intention is to prosecute work vigorously at once.

THE WYLLIE & LEONARD.—G. Wbeelock, of Cave City, is engaged repairing the old arastras at this mine, on Murray creek, a little above Culhertson's ranch.

PINE LOG MINE.—*Citizen*, July 19: At the Pine Log mine, New Jerusalem, near Copperopolis, progress is being made on the mill now in course of erection. Everything is being huilt in a substantial manner for permanent business, and extra room made on the mill-site for more stamps as necessary. Mr. Vietong, the superintendent, heing an experienced quartz miner and business man, is very much pleased with the abundance of good ore that can be obtained easily on the claims which he has in charge and hopes to have the mill running in a few weeks. But his lucky find capped the climax. While taking down the old mill, there was found under the batteries and sluices enough amalgam to pay for the lumber for the new mill, estimated somewhere near $1000.

El Dorado

OAK.—*Mountain Democrat*, July 19: Henry Zumwalt was down from the Oak mine, Indian Diggings, on Monday, for material, The new mill is framed ready to be put up, and work will at once he pushed on getting the structure ready.

Inyo.

MODOCK WEALTH.—Inyo *Index*, July 16: Frank Fitzgerald, lessee and manager of the company mines at Modock, was in town Sunday. He informs us that the ore shipment for the month of June amounted to $6070 71. A single carload shipped by a chlorider paid $1736.36.

BORAX.—We are informed hy Mr. Trudo that that they will commence to haul borax out to Alvord in a short time, as the pack train to Cerro Gordo has heen hauled off. J. H. Roberts will not commence to put up his works hefore the bot weather is over. Then we shall expect to see large shipments of borax from Saline Valley.

GALENA.—Inyo *Independent*, July 19: When P. Key and A. J. Davis were taking out galena ore recently at the White Hills they encountered a vein of ore of unusual character. It is not crystallized like galena, nor is it so heavy. It is hrittle, fine-grained, has dark luster and very dark color. It was thought to he worthless, and several tons were thrown down the mountain. As a matter of curiosity a sample of the ore was sent to Mr. J. A. McKenzie, at Darwin, for assay. Mr. McKenzie replied that he found the ore contained 772.30 ounces silver per ton. He thinks that it also contains gold, and reported that he would assay for that metal. Key & Davis are not throwing any more of the ore down the mountain. It is not yet known how extensive the ledge may he.

Nevada.

SHAMROCK MINE.—Grass Valley *Union*, July 17: The Shamrock quartz mine, located helow Forest Springs and owned hy Patrick Riley and John M. Thomas, has been honded for eight months to Illinoisans, represented hy R. S. Raw, who has made all arrangements for the commencement of work, and will at once proceed to the erection of steam hoisting and pumping machinery. The Shamrock is a location of 1500 feet, held under U. S. patent. The original owners were James Harrigan and John Tierney, who had light machinery on the claim some 12 or 15 years ago. The prospects were then good, hut the machinery was too light to contend with the water encountered, and the owners were not ahle to put up a more expensive plant, and work was discontinued. The Shamrock is on the same quartz system as the Slate Range and the Noramhagua mines, and is regarded as a good "prospect."

GOLD HILL.—Work at the Gold Hill mine is progressing favorahly under the immediate direction of James Burke, one of the most experienced miners in the district. The incline shaft near the surface is hadly caved, owing to one incline heing constructed over another to make an even grade, and the long time in which the shaft has heen out of use has caused a caving of the ground and a necessity for reconstructing the upper portion of the incline.

MANHATTAN. — The machinery and material having been delivered, the work of erecting hoisting and pumping plant on the Manhattan mine, Gold Flat, will be commenced. Supt. Elliott, who went up to Nevada City yesterday to conduct the operations of constructing, says the work will be pushed as rapidly as possihle, and that he is confident that everything will he in readiness to commence forking the water hy the 1st of August.

THE DERBEC MINE.—*Transcript*, June 21: A gentleman who recently inspected the Derhec drift mine says that it is in fine condition, and there is an immense amount of gravel in sight which looks well. New ground is heing opened all the time, and the prospect is good for paying seven or eight dividends per year for several years to come. This property has yielded over $1,500,000 since work was first commenced, and yet little more is heard about it than if it were a non-working and non-dividend property. There are over 100 men constantly employed, and with the exception of the Idaho quartz mine, the Derhec employs more men, yields more gold and pays more dividends than any other mine in this section of the State. All the stockholders of it reside in San Francisco, and the stock is held by so few persons that but little is said or known about it.

NORTH BANNER.—*Tidings*, July 19: The output of the North Banner mine this month will be, it is stated, between $12,000 and $15,000, and the expenses under $4000. Thirty-eight men are employed.

Placer.

A BIG ENTERPRISE.—*Herald*, July 19: Under the direction of C. P. Udell, work has been resumed in a small way on the big tunnel being run by the Muir Tunnel and Cons. Mining Co. at Michigan Bluff. This enterprise was started some years ago, but for reasons best known to the company has been holding fire. A number of channels lies in the divide through which this tunnel is directed, and it is proposed, on the principle of the Sutro tunnel, to drain them and open them all hy means of this one hig outlet. The enterprise is one that will require a good deal of money to prosecute. Its success, however, would not only contribute largely to the gold output of the county, hut would restore to Michigan Bluff, near which town the tunnel has its opening, the life and prosperity that belonged to it in early days.

RICH PICKINGS.—We learn from O. J. Spencer of Iowa Hill, who was in Auburn early in the week, that last Saturday and Sunday there was picked from the hedrock of a mine near the Hill, which Sprague and others are working, 168 ounces of gold, the chunks varying from 15 ounces down. This does not look as though mining was played out, as some pretend to helieve.

Plumas.

GREEN MOUNTAIN. — Greenville *Bulletin*, July 19: We are credibly informed that the Green Mountain mine was turned over to G. P. Cornell on Monday last. This important mining property has been tied up in litigation more than three years, much to the detriment of the stockholders and the prosperity of this part of the county. Connected with the mine is a 60-stamp mill. The lower tunnel is into the mountain nearly a mile, and taps it at a depth of about 1800 feet. During the progress of this tunnel on the main quartz vein, much fine ore was extracted and a great deal of money obtained. The country on either side of the tunnel is unexplored, there not being a crosscut the entire length. A great deal more importance attaches to this move, from the fact that Mr. Cornell has control, also, of the cluster of mines beyond the face of the Green Mountain tunnel and lying on top and on the western slope of the mountain. This includes the Ano, Altoona, Kettle, Caledonia, etc. The Altoona is owned by Judge Emmons, who operated it last year on a small scale, hauling the ore a long distance and leasing a mill to crush it. The ore vein is large and the owner informs us that it yielded him a handsome profit, notwithstanding the disadvantages under which he operated the mine. Tapped at great depth hy the Green Mountain tunnel, this property would, no douht, yield rich returns. The same is true of the Kettle and the Caledonia, both of which were operated years ago, through shafts, the former paying, we are informed by an old miner, from $12 to $18 per ton, for a period of nearly two years. The ore was hoisted and drawn nearly a mile for crushing. All of these properties combined will make a hig mining proposition, and a consolidation we helieve to be the proper step to take. The *Bulletin* has always maintained that the Cherokee properties should be operated in connection with the Green Mountain. This proposition has found support in New York and in Plumas. If these properties are rehahilitated and the proper amount of capital enlisted, as now seems probable, much good will accrue to Plumas Co., and to Indian Valley in particular.

Shasta.

PAYING.—Redding *Free Press*, July 19: The Banghart mine on Mad Mule, recently purchased hy Bauder & Fleming, is said to be a piece of well-paying property. A gentleman told us that last May he saw two nuggets weighing over a pound each that were taken out of the mine, and in one day the owner took out $1600. The Meade boys and Bill Wilson are negotiating the sale of their mining property located on the Shasta divide. Work was prosecuted on it all last winter, a shaft having been sunk to the depth of 45 feet. At the hottom of the shaft the ledge is five feet wide, showing well in free gold.

CASTLE PEAK.—A. J. Rex, who is working for Mr. Connor, owner of the Castle Peak and Sky Blue mines, showed us some specimens Thursday that were taken from a new strike on Castle Peak ground. The ore appears to be very rich, being freely sprinkled with coarse gold. The strike was made on Monday, and it now looks as if Mr. Connor has the richest thing in the county, having three mines on any one of which a man can make $15 a day with a hand mortar.

IRON MOUNTAIN.—Shasta *Courier*, July 19: James Sallee has gone East in the interest of the Iron Mountain mines. During his absence the mine will be in charge of Jas. L. Richardson. We understand a wealthy Eastern company are negotiating for an interest in these valuable mines.

San Diego.

THE EAGLE MINE GONE.—Julian *Sentinel*, July 19: The Eagle mine has heen owned for years by Mallock & Crase. Considerable development work has been done on it, but the owners heing poor men they were not able to work it extensively. It joins the High Peak, spoken of last week as the property of Messrs. Frost & Burnett. These gentlemen are so well pleased with the way things are "panning out" up here that they have honded the Eagle for $6000 and expect to commence development work as soon as suitable arrangements can be made. Thus the old claims that have lain idle for years are passing into hands of men with capital and enterprise, and as the result the camp will soon be turning out more hullion than in its palmiest days.

Trinity.

CANYON CREEK.—Trinity *Journal*, July 19: The owners of the Fisher Gulch have a shaft down 40 feet. The ledge is from 20 inches to three feet wide and is good milling ore. Grigsby's Buck's Ranch mine was next visited. Six men are at work on this property. The shaft that gave flattering prospects had to be ahandoned on account of water coming in and making the sinking of it too expensive. Mr. Grigsby is now running a tunnel to tap the ledge under the shaft at a depth of about 35 feet. The ore in the ledge is quite rich, and a good clean-up is expected as soon as a run on it can he made with the improved arastra that Mr. Grigsby has in good working order. At the upper side of Buck's Ranch a ledge has heen cut that measures from 13 to 14 feet hut is low grade. It will probahly mill $5 or $6 per ton, and as it is very easy to work, it will probably pay well if machinery is ever put on it. A good water right and plenty of wood makes the location for a mine an excellent one. The ledge runs from 4½ to 14 feet in width. Mr. Grigshy says he can crush about 6 tons a day in his arastra which he will start up next week. Boyce & Eligh are doing some work on their ledge which shows up pretty well. They have just started a tunnel commencing where the ledge crops out on the hillside. After leaving the Buck Ranch country we took a circle around the mountain to the location of Carlson, Benjamin & Hutchins. We finally landed about 100 feet below the tunnel that is being run on the above named mine. They expect to complete the tunnel in about ten days that will tap the ledge between 50 and 75 feet. A little more tug-of-war with the brush and we arrived at the Bailey mine, owned by Bailey, Smith & Flowers. They now have the tunnel within about 25 feet of where they expect to tap the second ledge. If struck here, and there is very little doubt about the matter, the depth will be very near 300 feet, and as the ledges are from four to seven feet, this would give them an immense amount of stope. They have three ledges, but the lower one has been developed but very little. We learned from Mr. Grigsby that the Whitten Brothers of Napa had discovered several ledges above Buck's Ranch and last Saturday made four locations over the ridge into the head of Owen's creek, which empties into Steuart's Fork. The quartz they brought to camp, Mr. G. said, was very rich and the brothers were very much excited over their find. There seems to be no reason to doubt that ledges will, before long, he found near the head waters of Rush creek, East Weaver creek and on this side of Bally. When such a thing is done, old Weaver will boom.

A NEW STRIKE.—*Journal*, July 19: M. R. Newman informs us that the Brown Bear Mining Co. has made a new strike in the Coon Dog ledge. The ore on the surface was not rich, hut the company ran a tunnel to tap the ledge at a considerable depth. The tunnel cut the ledge this week and a good hody of ore was disclosed. The company is taking out $80 rock from the ledge.

Tuolumne.

SULPHURETS.—Tuolumne *Independent*, July 16: The Golden Gate sulphurets are now being shipped to and worked at Angels Camp. Heretofore the ore has heen worked at the Sonora reduction works, but owing to some misunderstanding between Mr. Maltman and Mr. Fiscber, the former has refused to have anything to do with the sulphurets.

NEVADA.

Washoe District.

ORE AND BULLION YIELD.—Virginia *Chronicle*, July 19: This week's ore yield of Comstock mines aggregated 7473 tons divided as follows: Consolidated California & Virginia, 2749 tons, assay value $16.50 per ton; Savage, 448 tons, assay value, $23.60 per ton; Hale & Norcross, 1036 tons, assay value, $16.61; Yellow Jacket, 490 tons, assay value, $21.75; Crown Point, 850 tons, assay value, $16.17; Justice, 196 tons, assay value, $29.87; Alta, 340 tons, assay value, $20.50; Overman, 480 tons, assay value, $22.50; Chollar, 522 tons, assay value, $19 27; Belcher, 362 tons, assay value, $19.66. Following was the hullion yield of the ore product from each of the above mines, estimated on the probability that 80 per cent of the value of hattery sample pulp assays was returned: Con. Cal. & Va., $37,000; Savage, $8,500; Hale & Norcross, $14,600; Chollar, $8150; Yellow Jacket, $8500; Crown Point, $11,500; Overman, $8600; Alta, $5500; Justice, $4.800; Belcher, $7,100. Total, $114,250.

SIERRA NEVADA. — On the 630 level the west crosscut from the southwest drift, 60 feet from the shaft station, is advanced 436 feet. At a point 16 feet from the face of this crosscut a north drift is advanced 45 feet in quartz, clay and porphyry, showing low assay value.

UNION CON.—On the 1465 level from the north lateral drift, opposite west crosscut No. 4, east crosscut No. 1 is in porphyry, carrying some water.

MEXICAN.—On the 1465 level, at a point 70 feet south from west crosscut No. 4, west crosscut No. 5 is advanced 229 feet, continuing in porphyry showing some clay.

OPHIR.—On the 1300 level, the winze at a point 66 feet southwest of the raise is down 87 feet, continuing in low-grade quartz.

CON. CAL. & VA.—The 1300 and 1500 levels continue to yield the usual quantity of ore. Shipped to the Morgan mill 1699 tons and 520 pounds of ore, and to the Eureka 1649 tons and 1550 pounds, battery sample assays showing an average value of $16.50 per ton (2749 tons milled). Shipped hullion valued at $12,630.90 to the Carson mint.

BEST & BELCHER.—On the 1200 level west crosscut No. 1 is extended 81 feet. Formation, porphyry, clay and quartz showing some value.

GOULD & CURRY.—On the 625 level, all work is still confined to repairing south drift.

SCORPION.—The southwest drift from the 660 level shaft station is advanced 690 feet, and continues in clay and porphyry.

ANDES.—On the 420 level the north drift from west crosscut No. 2 is in 77 feet; formation, quartz, clay and porphyry, giving low assays.

SAVAGE.—Shipped 448 tons of ore, showing an average value of $23.60 by battery sample assays. The 1300 level north drift is in 110 feet and continues in good ore. There are 7 sets of timbers in place following the ore. Extracting ore from the 300 to the 1300 level. No change in explorations at other points. Bullion on hand valued at $14,000.

HALE & NORCROSS.—Shipped 1036 tons of ore during the week, showing an average value of $16.61 per ton by battery sample assays. Bullion on hand on July account valued at about $10,000.

WARD COMBINATION SHAFT.—The 1800 level east drift is advanced 436 feet and the west 388. Both are in porphyry.

CHOLLAR.—Extracted 522 tons of ore, battery sample assays showing a value of $19.27 per ton.

POTOSI.—The 930 level east drift from the winze is in 32 feet from the footwall and has reached what is believed to he the hanging-wall of the vein. The material passed through was porphyry and fair-grade ore. Cutting out a station on the 1030 level is being pushed to completion.

ALPHA.—The 600 level southwest crosscut is in 71 feet, the face in quartz and clay. East crosscut No. 2, same level, is in 37 feet, face in quartz and porphyry.

EXCHEQUER.—The 500 level east crosscut is in 82 feet, the face in clay and porphyry. The 600 level north lateral drift is out 396 feet; face in porphyry and quartz.

CON. NEW YORK.—The north drift from the top of the raise above the 800 level is out 307 feet, the face in porphyry.

YELLOW JACKET.—Shipped 490 tons of ore showing average assay value of $21.75 by battery sample assays.

CROWN POINT.—Shipped during the week 850 tons of ore showing an average value of $16.17 per ton hy pulp assays.

CONFIDENCE AND CHALLENGE.—Joint imperial west crosscut No. 2, 1000 level is in 222 feet, face in quartz.

BELCHER.—Have started a stope in the 1000 level south crosscut and have opened two sets wide in ore. Shipped during the week 362 tons of ore showing a value of $19.66 per ton by battery sample assays.

SEG. BELCHER.—The raise above the 1000 level east crosscut No. 1 is up 177 feet, the top continuing in low-grade quartz. Have discontinued work in the top and started sinking a winze below the 1300 level directly under raise No. 1 above that level.

JUSTICE.—During the week crushed 196 tons of ore showing a value of $29 87 per ton by battery sample assays.

ALTA.—The ore output this week was 340 tons, showing an average assay value of $20.50 per ton by pulp assays.

OVERMAN.—Shipped 480 tons of ore during the week showing an average value of $22 50 per ton by battery sample assays.

UTAH.—On the 725 level at a point in the south drift, 130 feet from the main north drift, west crosscut No. 1 is advanced 69 feet and has reached the footwall. The formation passed through was porphyry and quartz.

OCCIDENTAL CON.—Continue to extract ore of fair quality from the stopes on the 400 and 450 levels. The crosscut from the bottom of the winze below the 550 level is in twelve feet, showing low-grade quartz. East crosscut No. 2 is in 242 feet, the face in hard porphyry. The 650 level main north drift is extended 171 feet, showing low-grade quartz. Crosscut No. 2 from the end of the drift is in 24 feet and has reached the clay wall. The formation passed through was low-grade quartz and bunches of good ore.

Eureka District.

DIAMONDVILLE. — Eureka *Sentinel*, July 19: The Diamond mine is reported to be looking away up. The new boarding-house is the handsomest and most substantial structure of the kind in this district. A large gang of mechanics and laborers are busily engaged in the erection of the new machinery below the mouth of the new tunnel, which is now in about 300 feet. Diamondville presents a very solid and businesslike appearance, and will, no doubt, be to Eureka in the future what Ruby Hill was in the past.

ORE SHIPMENTS.—During the present week the

Eureka & Palisade railroad shipped 490 tons of ore to the Salt Lake City smelting works.

Tuscarora District.

NEVADA QUEEN.—*Times-Review*, July 18: Upraise from 600 level of North Belle Isle is up 59 feet. Rock is hard, breaking bad. Progress for the week, 13 feet.

NAVAJO.—West crosscut at the north end line, 250-foot level, extended 16 feet.

DEL MONTE.—2d level: Line crosscut east has been advanced 9 feet and west 17 feet. Going east should intersect upraise from 3d level in about 10 feet.

YOUNG AMERICA SOUTH.—1st level: West drift extended 12 feet, and cut a ledge running northerly and southerly, and carrying one foot of good ore.

BELLE ISLE.—Upraise from south drift, 350 foot level, extended 11 feet, rock hard and air bad.

GRAND PRIZE.—400-foot-level: Stopes on the east and west vein continue to yield a good quantity and quality of concentrating ore. Stopes from the south drift are furnishing the usual quantity of $20 concentrating ore. Concentrator running steadily and doing good work.

COMMONWEALTH.—The work of extracting ore has been resumed preparatory to starting the mill, and work in some of the drifts on 3d level has been suspended for a few days, owing to scarcity of miners. Two hundred and twenty-five tons of ore hoisted; average assay, $27.21 per ton. The mill is being put in order for starting.

NORTH BELLE ISLE.—No. 2 upraise from north gangway, 600-foot level, extended 6 feet, vein showing bunches of good ore. West crosscut from north gangway, same level, extended 14 feet; face in vein formation.

NORTH COMMONWEALTH.—3d level: No. 1 raise from No. 1 south drift has been connected with 2d level, giving fine ventilation. Ore chutes are being put in, ready for stoping. The ore bin being built on the surface will be completed this present week. All ore hoisted heretofore has been dumped on the ground.

ARIZONA.

FORTUNA. — Prescott *Journal-Miner*, June 17: J. R. Duling has taken a working bond, with privilege of purchase, of the Fortuna mine on Lynx creek, Walker district, and put a force of men at work to-day, developing the property. The general impression seems to be that Mr. Duling has an excellent property.

SILVER KING.—The shaft in the Silver King mine is down 130 feet, at which point they are cutting out a station for the purpose of drifting. Some of the richest ore yet discovered in the mine was struck at this point, being gold sulphurets, running several hundred dollars per ton.

ORE RECEIPTS.—W. M. Claypool reports heavy receipts of ore at the sampling works, indicating great activity among miners. The ore is arriving from nearly every district in the county.

COPPER. — Both water-jacket furnaces of the United Verde Copper Co. at Jerome are running. A new reverbatory furnace is also being constructed.

HASSAYAMPA.—W. H. Harlan was in town today, and says that his mill on the Hassayampa is still crushing ore from the Howard and other mines owned by him there. The Aztec, in which old workings have been found, and in which relics of the stone age have also been discovered, continues to look well and yields good ore. About 40 men are at present employed in the Ryland mine. Mr. Riley expects to start the mill up again next Monday. The latter has been closed for some time, being remodeled.

TIP TOP. — Prescott *Journal Miner*, July 17: Messrs. Bircben, Bowers and Herman are doing much work on several claims around Tip Top, and are shipping every few weeks a carload of carbonate to Socorro or El Paso. The Tip Top, under its new management, is turning out a large quantity of pay ore. Several lots shipped from this property have run out $1000 to the ton. Marlow, Carter & Johnson, on the Bullwhacker claim, are striking it rich. They have a shaft 75 feet in depth, with several drifts all in good rock. The vein is about three feet in width, a high-grade streak four inches wide running through the center of it. The ore is free milling, without any base admixture.

SILVER MUSEUM.—The well-known Silver Museum mine, a few miles beyond Gillette, has lately been leased by South, Lenhart & Co. of Trinidad, Col., who are shipping rich ore and developing the mine by running drifts into even richer rock.

FOURTH OF JULY.—The Fourth of July mine, owned by Tom Wade and Louis Johnson, is being profitably worked. This property is located on a steep side-bill, and a tunnel has been run along the ledge to the depth of 400 feet. Another tunnel has just been commenced, which will strike the ore body 100 feet farther down. The ore is very rich, but is charged with sulphurets, arsenic and antimony.

PAY ROCK.—J. W. Taylor and H. Norton are shipping pay rock from the Seventy-Six mine, and small lots are brought to Phoenix frequently by chloriders who seek simply for a grub stake to purchase powder, tools and provisions, and who are earnestly working to turn their prospects into mines.

COLORADO.

TELLURIUM GULCH STRIKE.—Aspen *Times*, July 17: C. A. Goss and F. F. Nelson are feeling somewhat elated over the showing made in the New York mine in the Lincoln district, which they are working under lease. The property has always produced some good ore, but the lessees have come upon a chute of good size that promises to yield them a handsome profit. The ore produced from the new discovery runs 114 ounces and its character is very desirable.

THE HANNIBAL.—The Hannibal is now showing a streak of ore that runs up to 140 ounces, while there is a considerable body of mineral averaging from 40 to 50 ounces. The rich streak is about 16 inches thick.

DAKOTA.

D. & D. SMELTER.—Deadwood *Pioneer*, July 15: The D. & D. Smelter went out of blast yesterday morning on account of being entirely out of pyritic ore. A carload of coke was received at the works on Sunday, and four more are on the way here. The smelter will blow in again as soon as a supply of pyrites can be hauled. Everything about the plant is working to perfection. The Hester A. Co. began delivering ore yesterday at the Deadwood and Delaware smelter. The delivery of Seabury-Calkins and Maggie continues without interruption. The Northwestern began the delivery of coke at one o'clock Monday morning and continued it all day yesterday.

IDAHO.

HUNTER DISTRICT.—Wardner *News*, July 12: Under the management of Francis Agnew the Hunter mine keeps 75 men employed with John Hanley as superintendent. The Burleigh drills are doing good work in tunnel No. 3, known as the Kavanaugh tunnel, where a fine body of ore is visible. The mill, under the direction of Robert Herman, late of Wardner, is running day and night treating over 100 tons of ore every 24 hours.

LUCKY FRIDAY.—This mine is now under the management of Robt. T. Horn, who has the property under bond and lease for six months. Four men are continually employed. The incline is down 80 feet with a crosscut of 40 feet in fine ore—chlorides and carbonates. The ore is free milling and will run 100 ounces to the ton.

CENTRAL.—Jack Empfield keeps steadily developing the Central mine on Boulder creek, which is daily improving in appearance. A New York syndicate having an option on the property for 30 days are expected here immediately.

DAISY.—John Lanihan, P. McGraw and Dan Finn are still sinking on the Daisy. Last week they struck a fine body of ore near the creek.

SUMMIT DISTRICT.—J. W. Sweeny is the discoverer and locator of what is known as the monumental group of claims lying between Cougar and Wesp gulches in Summit district. The ledge is well defined, running east and west with hanging and foot walls of decomposed slate. The ore is carbonate of lead, containing about 50 per cent lead and carrying considerable silver. The property is owned by J. W. Sweeny, A. E. Mayhew, and S. P. Donnelly.

A STRIKE.—Idaho *Avalanche*, July 19: Geo. W. Stoddard, who is about as persistent a prospector and good judge of ore as any in the camp, has for some time past been working on one of his claims, the Injector, situated near the Morning Star and from which some exceedingly rich ore has been taken in the past, and has recently struck a body that far exceeds in richness anything before found. Much of the ore is literally full of gold and silver and will go way up in the thousands per ton.

LOWER CALIFORNIA.

ALAMO.—*Lower Californian*, July 17: A run of 13 tons of Aurora ore through Kerr's mill the other day netted 40 oz. of gold. The ore was from that part of the mine leased by Vermason and partners. Shaw and partner, placering in the little gulch above the Princesa, struck it rich the other day, washing out two ounces in one day and finding rich float indicating a blind ledge. They are prospecting for it. The Princesa Co.'s big boilers, pumps, roller mill, feeders, crushers, etc., arrived Saturday, and the boilers are being placed by Supt. Rodda on the Indio and Ulises, the two great mines (supposed) of the camp. These mines have been water-logged for a long time but the ore taken out previous to their overflow was of great richness. Since then, also, many tributers have worked stringers on the Ulises, and came as near to getting rich as is possible under the contract system in vogue. A foundation is being made for the duplicate Huntington mill for the company, near the present one. Extensive banking is being done and large excavations made at the mill site. About twice the present number of men employed by the Princesa Co. will be required from now on, besides a large force of tributers who are waiting until the water can be pumped out of the San David, Indio, Ulises and others. The Telémaco has been hard at work under Foreman Poole and almost enough ore is extracted to supply the mill. The El Paso mill is working on custom ore and has all the work it can do. Supt. McLaran is quite popular with the boys. L. B. Howard has put a force at work on the Arabella, and the rest of the Butler mines will be opened soon. Kerr's mill is kept busily at work and good results are obtained. Col. Lane's old reliable Wiswell mill grinds away on a stack of ore that is never suffered to diminish. Good satisfaction exists among all who have made runs through this mill.

THE CEDROS ISLAND MINES.—The steamer Pacheco came up from Cedros Island, Tuesday forenoon, with a few passengers and 2549 sacks of gold ore. Over 1000 sacks of ore had to be left at the landing, owing to the lack of room on the steamer. Wilson, a teamster in the employ of the mining company, discovered two ledges of silver ore near the steamer landing a few days ago, one of them assaying 78 per cent silver. They will soon be developed. A ledge of iron ore, carrying gold and silver, is also among the new finds on the island.

MONTANA.

BRUCKNER FURNACES.—Helena *Review*, July 17: Fraser & Chalmers have ordered 106 Bruckner furnaces for the Anaconda Co.'s upper works. When they are put in that company will have 200 in operation.

PLACERS.—The placer mines of Diamond, Jefferson county are actively at work and not an idle man is found in the camp. Last Monday the Diamond express brought down W. J. King, who had between $8000 and $10,000 worth of gold dust with him. The trip was made at night. If the water continues even as it is now, the yield will be considerable this summer.

CASTLE.—Mr. Suydam, of Castle, was here Monday on his way to Butte. He is of the opinion that Castle is the greatest carbonate camp in the world. He thinks the Yellowstone is as good a mine as the Cumberland.

STONY CREEK PLACERS. — Phillipsburg *Mail*, July 19: Jesse Wilkinson, foreman of the Stony Creek placer property, left Phillipsburg Wednesday morning at 4 o'clock with a wagon-load of supplies and a crew of men to commence operations on the ground. They will get the ditch in shape and get down to work in about 20 days, the *Mail* is informed. There is considerable preparation to be made before development work can be properly carried on though it is believed that everything can be gotten in running order in that time. Mr. Wilkinson is an experienced miner and will get whatever value there is in the placers. There is plenty of water and ground, and as the latter prospects well, we see no reason why the property should not pay from the time the water is turned on.

COMBINATION.—Sinking has been commenced on the new shaft again, and will doubtless be continued for 50 or 60 feet. They are now down over 130 feet. When the necessary depth has been attained they will run a drift and stope the ore out. The buildings of the company are being given a coat of paint, and everything is going on satisfactorily. A few men have been put to work on the Tim-Smith claim, which the company bonded some time ago, and upon which it is understood that they have recently raised the bond. They also contemplate doing some work on another one of their undeveloped properties.

THE HIAWATHA.—Anaconda *Review*, July 19: The Hiawatha is certainly promising to be a great mine. The lead has a width of 11 feet. Through it for some time have been hair-wide streaks of pure silver, and these seem to have been converging to a common point, until now the streak of rich ore running from 5000 to 20,000 ounces to the ton is about an inch wide, and what is best news, is that it is increasing in width. The tunnel of the Hiawatha is in 320 feet, and from the end there is a winze sunk 57 feet, making a depth on the vein of 160 feet. Work is progressing on the shaft, a steam hoist is on the way to the mine, and about the middle of this month the men will begin sinking the shaft and the work prosecuted as rapidly as possible. Eleven men are employed.

NEW MEXICO.

CONCENTRATES.—Silver City *Enterprise*, July 18: Messrs. Bell and Brown shipped a carload of concentrates from the Tampico mine, Pinos Altos district, during the week. Three tons of concentrates from the Good Hope, Chloride Flat, Carson & Lucas owners, was among the ore shipments of the week ending July 19, 1890. The probabilities for the immediate resumption of work on the Solid Silver Co.'s claims at Black Hawk are very encouraging. The one-sixth interest in the Cora Miller, owned by John T. Mitchell, has been sold to Maj. W. A. Hutchinson of San Angelo, Texas. The mine is now entirely owned by San Angelo and Los Angeles people. A new strike which is looking well at grass-roots was made by Dan Casey in the Lone Mountain region last week. The negotiations, for some time pending in reference to the sale of the Maud S. in the Mogollons have been consummated, papers being placed in escrow a few days since.

BALD MOUNTAIN.—Mining matters are picking up, and prospecting at Bald Mountain is becoming quite active. John Stone is taking out high-grade smelting ore from the Carrita, which is looking well, and bids fair to yield the energetic miner excellent returns for his labor. A carload of copper ingots, 15 tons, will be ready for shipment from the Anson S. mine by next Tuesday.

HACHITA.—The developments now being made by Mr. Tyler on the mine he recently purchased have shown wonderful improvement. The product is valuable shipping ore. The lower grades will be milled in the vicinity of the mine.

OREGON.

A CLEAN UP.—Grant's Pass *Courier*, July 16: Mr. H. B. Whiting has cleaned up in his mine near Kerbyville, and intends this fall to bring in a ditch from Sucker creek so he can work his claim the entire year. Nick Thos and James Farren are engaged in mining on Silver creek above the falls. They will endeavor to break the falls so they can mine the ground above which is known to be very rich, but not having sufficient fall has not been worked. Frank Dessenger, while in the city this week, kindly showed us a nugget taken from the hydraulic mine owned by John S. Haverly on Canyon creek, which weighed $20.10. Messrs. Frank Norris, John F. Ryan and E. Baldwin were in the city from their Reuben creek mines Saturday, reporting the diggings to be paying well, and that they had taken out 24 ounces in two weeks and three days, numerous nuggets weighing from $1 to $30, and that their claims were paying $10 per day to the man.

PROSPECTING. — Jacksonville *Times*, July 19: The Illinois river district will be thoroughly prospected this summer. A clean-up was made at John Goff's hydraulic mine near Leland recently, with the best of results. Lance & Duffield have done well at their mines in Foot's creek district, cleaning up over $3000 this season. One of the best clean-ups in southern Oregon was made at the placer mines of Hosmer & Anderson in Foot's creek district. It is stated that they took out $5000 in gold-dust. Norris, Ryan & Baldwin report having taken out 24 ounces of dust in 16 days recently, including nuggets ranging from $1 up to $30, from the Reuben creek mines. The ground above the falls in Silver creek will be worked by Nick Thos and James Ferren this season. They will have to break the falls in order to reach the richer diggings. A local exchange says that the Brookfield & Griffiths quartz ledge near Tolo will be worked by a company, and a 10-stamp mill erected this summer. Eight men are now at work in the mine.

UTAH.

LITTLE COTTONWOOD. — Salt Lake *Stock Exchange Journal*, July 17: Little Cottonwood has been heard from again in the shape of a reported find in the Emma mine, that is said to be immensely rich. The Emma is largely controlled by an English syndicate, but a number of Salt Lake people are interested in the property. The Emma has been a great producer and dividend payer, but has been in litigation for some time.

CINNABAR AND GOLD.—J. F. Corker has on exhibition at his office a fine specimen of cinnabar and gold ore. The ore goes from $10 to $20 in gold and a large per cent in cinnabar. The ore comes from a new find in Utah in a new district. Mr. Corker and several Salt Lake parties have a bond on the claim. This ore vein is 20 feet wide and is inexhaustible.

ACTIVE.—Eureka *Chief*, July 19.—There is increased activity in the south end of the district. Several new discoveries of rich ore have been made in the past few months, and the prospectors, encouraged thereby, "are getting down to their knittin'." Several promising prospects have been bonded by outside capitalists who are putting in machinery and preparing to go after the pay-dirt in the most approved fashion. Mining men are arriving at Silver City daily on the lookout for "something good," and all in all there is every indication that our sister camps are entering upon an era of unprecedented prosperity.

ANOTHER BIG SALE.—Monday morning Wm. Matthews, Dennis Sullivan-Beck and Frank McHatton sold to the Continental-Eureka Co. their three-fourths interest in the Lookout and Summit mining claims, situated above the Blue Rock on Eureka Hill, and adjoining the Alta and Overman. The purchase price was $80,000 and it was spot cash. These are the claims which the owners and the Centennial-Eureka have been lawing over for some time. Thus does Tintic District continue to wax great.

THE EMMA STRIKE.—Salt Lake *Tribune*, July 19: A report gained some currency a day or two ago that a strike had been made in the Emma mine at Alta. As is often the case, this rumor assumed various forms, while nothing definite could be learned except by a visit to the property. Yesterday a *Tribune* reporter went to Alta and learned through various sources the real facts. Going back to the history of the Emma mine it is enough to say that in 1871 it was sold for $1,200,000, and it has produced in all about $5,000,000. Since 1876 the mine has not paid anything to the owners. The early workings extended down about 250 feet below the collar of the shaft. After working out the ore chambers in that portion of the mine, down to that depth, the company began another system of developing and working the property through the Bay City tunnel. This tunnel was run nearly 300 feet below the collar of the old shaft. This tunnel is now in 1800 feet. Below the level of this tunnel a shaft was run some 400 or 500 feet and levels run to the lode. Prospecting is still going on at six different points in the mine and ore has been found at all these places. Below the Bay City tunnel level ore is found, but is of very low grade. It is above the Bay City tunnel level where the late developments of ore have been made. The best strike is 200 feet higher than the tunnel, and what is important, is in entirely new ground. The old chamber, from which millions of ore was taken, fell in after it had been dug out. Lately a drift was run through this old chamber into the hill a distance of 200 feet. In doing this the top of an ore chimney was cut through, showing a vein two feet wide. It was then decided to sink an incline shaft on this vein, which has a dip of about 45 degrees. This shaft has gone down 25 feet, and in that distance has widened from two feet to eight feet and it is still widening. This vein at the bottom of the shaft has five or six feet of good ore out of the eight feet in width, while the balance is good for concentrating. This ore is all taken out each day in sinking this shaft, and about 60 tons have already come out. The value of this ore, taken clear across the vein, is about 50 ounces silver and about 40 per cent lead. This ore was cut about two weeks ago, and it has been growing better every day. This strike alone places the mine in a more hopeful condition than at any time in the past 10 or 12 years. Besides this strike, there is enough in other places where development work is being pushed to give hope for the future. The mine is now where it pays its way, and the big strike promises to open out into a great bonanza, and if so, there is in store a bright day for Little Cottonwood. The present outlook is certainly favorable for a big mine again of the Emma.

MINING OUTLOOK. — *Inter-Mountain Mining Review*, July 17: The mining outlook for Utah is beginning to shine with a new and delightful light. All along the line from Cache county in the north, to the Dixie land of the south, come words of greeting and great joy. New discoveries are being made every day, we might say every hour, and old claims are being delved into and made to produce in a manner which a year ago was neither thought nor dreamed of. The truth is, that mere speculation in mines is rapidly giving way to actual labor and substantial development, and those who hold properties of any consequence, realizing that the day for talking mines into prominence has long since passed, if for no other reason, are bestirring themselves in a manner at once praiseworthy and profitable.

PARK SHIPMENTS.—Park *Record*, July 18: The Ontario bullion product for the week was 35 bars, containing 19,169.60 fine ounces of silver. This week 9n22.5 pounds of high-grade and 8257 pounds of Daly base sulphides from the Russell lixiviation process were shipped from the Marsac mill. The shipment will aggregate a considerable sum in value. During the week there were shipped from the Crescent concentrator 270,970 pounds of Crescent concentrates, 161,7n0 pounds of Gilsch & Campbell's Crescent lease concentrates and 46,000 pounds of Hatch, Prisk & Co.'s Creole lease concentrates; total, 478,670 pounds. For the week just ended, the Mackintosh sampler received and forwarded 592,030 pounds of Ontario ore, 131,800 of Daly, 7n,890 of May Flower No. 7 leaser's ore, 119,150 of Flindt & Varcoe's May Flower jiggings, and 186,790 pounds of Anchor concentrates from the Union concentrator; total, 1,100,660 pounds.

WASHINGTON.

MACHINERY FOR THE LONE STAR.—Okanogan *Outlook*, July 17: As stated in the *Outlook* last week, the Lone Star will remain idle but a short time. General Manager Henry Lawrence, who left for Tacoma immediately after the fire to consult with his partner, Allan C. Masnn, has sent in word that new machinery has been purchased and is now in transit from Butte, Montana. Several additional men have been put to work clearing off the ground for the new buildings, which will be considerably larger than the old ones.

PROSPECTS OF MINES. — Goldendale *Courier*, July 19: Messrs. Haggard & Stout, who went out to Mt. Adams some time since, sent in some specimens of quartz croppings, which show considerable iron and some gold, and strong indications of lead and silver. We are informed that a mining district was organized with Almon Baker as recorder. It is beyond a doubt that if these men should succeed in finding a well-defined ledge of such rock as was sent us, that it is only a matter of a few months until there will be some rich strikes made. It is a foregone conclusion, in our estimation, that good-paying mines can be found nearer to this city than Mt. Adams.

MECHANICAL PROGRESS.

Philosophy of the Injector.

There is something mysterious to most engineers about the action of an injector. It seems a sort of paradox that steam of low pressnre can force water into a boiler against a higher pressure, yet we all know it is a fact. The action of the injector, too, is very hard to explain simply, although it may be simple enough itself. We notice a monthly contemporary undertook the task to explain its action, on the basis that it is the momentum of the moving steam that gives the injector its peculiar power. This was explained on the principle that a bullet thrown from the hand was harmless, yet the same mass thrown from a rifle has in its increased velocity greater momentum and greater penetrating power. Momentum has a great deal to do with the action of the injector, but there are other factors necessary. In explaining the injector we should not omit to mention that this momentum is concentrated on a very small spot, hence the energy that is generated at this point is of vast importance in the problem. If it were not for this difference in area of jets, or concentration of the energy in the moving steam, the injector would be of little value, depending on momentum alone. The steam condenses, and the energy that in the momentum of the steam affected a large area is condensed so that the same momentum affects a smaller area, hence is able to do considerable work. Practically the same thing is seen in the use of a burning-glass, by which the heat is condensed and brought to bear on a certain spot. There is no more heat in the matter. The same amount of heat passes through a piece of glass of an area equal to that of the lens, but in one the heat is condensed into one spot, and in the other covers a considerable area. So in the injector, there may be just as much momentum in an open pipe or one with a jet, but the one with the jet will force the water because all this momentum is concentrated on a smaller area, just as the heat in the burning glass is. A correspondent who has been making a test of his boiler has come across this point, over which he has pondered without reaching any definite conclusion. Water is forced into the boiler through an injector, and the question is this, whether the steam that is condensed in the injector is not carried back to the boiler and so re-evaporated without being weighed, the boiler thus actually evaporating more water than is credited to it. "This steam," he says, "must have been evaporated once, when used in the injector is condensed and goes back into the boiler as water, and must be evaporated over again just the same as though water from the tank direct. It has occurred to me that all this might be offset by the heat it gives to the steam, but as I figure, the evaporation from the temperature, after it has passed the injector, it seems as though this is offset. How am I to settle the matter?" We should pay no attention to the injector, but figure the evaporative duty of the boiler from the pounds of water pumped into the boiler. It will be found that the heat that has gone into steam in the boiler once is to all practical purposes still there, although the heat does travel from the boiler through a pipe and injector back again to the boiler. The heat will still be in the boiler, and if there must do its part toward evaporating more water, or one might say, the heat is there with which the steam condensed can re-evaporate itself after returning to the boiler.—*Boston Journal of Commerce.*

IMPROVEMENT IN SOFT-BACK STEEL.—Announcement is made that M. A. Howell, Jr., London, has taken out a patent for improvements in the manufacture of soft back steel. The invention relates to the manufacture of plates or flat bars of steel having one side highly carbonized and the opposite side practically free from carbon. Such steel is said to be less liable to break or crack while hardening, and is more tenacious when in use where great rotary force or heavy blows or strains are required. Plates or flat bars of soft steel or fine iron in pairs of equal size are placed back to back with a film of clay or other refractory material inlaid between them. They are then clamped or wired together, and the several pairs are placed "in a receptacle or flask stratified between layers of granulated charcoal." The flask, furnished at one end with an inlet tube and cock and at the other end with an outlet cock, is placed horizontally in a muffle. When the heat of the furnace has raised the temperature of the flask to a low red heat, a current of hydrocarbon vapor is driven over the plates, and when the heat reaches the cherry-red stage, the flow of gas is diminished and the operation continued until the metal has taken up enough carbon. Finally the cocks are closed, and the flask is disconnected and allowed to cool in an atmosphere of hydrocarbon. When cool, the receptacle is opened and the plates are taken out and forged, hardened and tempered in the usual way.

RATTLING OF MACHINERY.—The Pittsburg *Dispatch* tells of a ten-horse power engine which, on the upper story of a silverware manufactory, created such a commotion as to rattle the silverware on the shelves a hundred feet distant. A change of 25 revolutions in the speed, which change was in the direction of increasing the speed, entirely stopped the vibrations. The question is often asked: "Why do some gears rattle and others not on machines that are built just alike?" This is no doubt owing to the smoothness of action in the gears. The teeth should come in contact gradually and not meet with their highest driving strain until they reach the line of centers and then part with the same easy motion. The least jar, knock or pound from the slightest movement is going to make itself known.

"DETERMINING THE HAMMER BLOW."—A bill has been introduced in Congress at the instigation of the Franklin Institute and the U. S. Mechanics' Association, asking for an appropriation of $25,000 to defray the expense of determining the exact measurement of the "hammer blow" as it is produced by the counter-balance of a locomotive driving wheel. The *Railway Review*, in noticing the fact, has this to say: We should be as much pleased as any one to see this much discussed question settled, but we fail to understand why Congress should be asked for an appropriation to settle this question any more than in the case of other and more important ones involved in locomotive construction. Any road can determine in very short order the practical limits within which the weight of counter-balances must be kept if bridges and track are not to suffer. To determine the exact measure of the so-called hammer blow in foot-pounds is not so easy, nor is a knowledge of it especially needed at present except for the same use as that to which the appendix of an arithmetic is put—to give the correct answers to the mathematical problems contained in it. This would be an immense relief to the mathematician, and Congress might have sufficient compassion to pass the bill; but, while it adds to knowledge of the master mechanic, it would still leave him to find out how much of this kind of a blow his bridge would stand, and how little counter-balance he could use and still neutralize the effect of the reciprocating parts sufficiently for all practical purposes. If the assistance of Congress is really required, it would be better to have the best practical relation which the weight of the counter-balance and the reciprocating parts should sustain to each other so fully demonstrated as to remove all doubt from the minds of master mechanics. If Congress is going to hear the expense of scientific investigations desired by private interests, we think the list of applicants for such favors will increase very rapidly.

GOODS FROM DIES BY HYDRAULIC PRESSURE. Machinery for cutting out iron work by dies and hydraulic pressure is among the most important devices for labor-saving. Commencing in a very small way many years ago, such machinery is now constructed and employed on a mammoth scale. Only a few years ago, cooking utensils of small caliber began to make their appearance and excited much comment. Quite recently the public was not a little surprised at the successful establishment of works for cutting out a boat and shaping it at one operation from a single piece of iron; and now we notice a new departure in the same direction in wagon-building at Leeds Forge, England, where machinery, presses and appliances are being put down with a view to manufacturing railway wagon bodies from one piece of metal—iron or steel. The wagons are to be made by means of a press and dies, and in a comparatively short time from a heated plate the sides and bottom of a wagon can be formed. There will be no need of angle iron or steel, or of riveting.

A CHIMNEY THAT WILL DRAW.—To build a chimney that will draw forever and not fill up with soot, you must build it large enough, 16 inches square. Use good brick and clay instead of lime up to the comb; plaster it inside with clay mixed with salt; for chimney tops use the very best of brick, wet them and lay them in cement mortar. The chimney should not be built tight to beams and rafters. There is where the cracks in your chimneys come, and where most of the fires originate, as the chimney sometimes gets red-hot. A chimney built from the cellar up is better and less dangerous than one hung on the wall. Do not get your stove-pipe hole too close to the ceiling, but about 10 inches from it.

STEAM THERMOMETERS.—Thermometers for use in the boiler room for testing purposes, says the Boston *Journal of Commerce*, should be accurate, or their variations known. This can be readily proved by inserting in an open pot of boiling water, when the thermometer should register 212 degrees on the sea level and one degree less for each 500 feet above the level of the sea. Some steam thermometers are specially made with a stuffing-box arrangement, so that the bare thermometer is exposed to the current, but we prefer the oil-cup device because the thermometer can be removed or inserted without shutting down, and the results are just as accurate.

STEEL WIRE has been wrought into the form of a belt to run on pulleys by a process that will allow it to conform readily with the curve of the smaller wheels. The latest device seems to be an imitation of the leather-link method, which must give joints enough to work loose and to make all the slack that could be asked for.

A BUTTON sewing-on machine has been invented in England, and is said to work to a charm.

SCIENTIFIC PROGRESS.

Magnetization of Steel Cylinders.

An interesting note concerning the effect produced upon cylinders of steel along which strong currents are passed is given in a recent issue of the London *Electrician*. It is said that in 1887 M. Paul Janet showed that cylinders of steel, along which strong currents had been passed, became permanently magnetized transversely. By extending the experiments some very striking results have been recently obtained which are thus described:

The cylinders used were split longitudinally, and, after the passage of the current, the magnetism of the parts was tested by iron filing figures. It was then evident that not only was the iron magnetized transversely, but the intensity of the magnetization varied in a regular undulatory manner along the bar, the lines of force arranging themselves in somewhat the same way as fine powder in a vibrating tube. The effects could not be accounted for by supposing the iron heterogeneous, because the nodes and loops occurred at about the same distance for different bars of various diameters and lengths. M. Decharme concludes that there is a great difference in the magnetization of an iron core by a steady current passed through a solenoid surrounding it, and that of an iron bar through which a current actually passes. In the latter case, M. Decharme considers that the current is propagated in waves during the very short time necessary to produce the magnetization, and compares the phenomenon with the well-known undulatory magnetism produced by the oscillatory discharge of a Leyden jar. The effect is probably due to the starting of the current, and it is therefore unfortunate that no particulars are given of the manner in which this was done—whether switched on suddenly or increased very gradually to its full value. In the latter case, no effect might have been produced, as strong currents were needed to show the phenomenon. The experiments of Blaserna have shown that undulations do actually occur for the first few moments after starting the current, and it is possible that these may be much accentuated when part of the conducting conduit is of iron. The experiments are of interest because they suggest that many phenomena usually attributed to want of homogeneoneness in iron may really be due to successfully starting and stopping a magnetizing current.

Meteorological Notes.

The explanation of the peculiar density of thunder clouds is said to lie in the fact that the vapor is partially condensed into drops by the electrical action. This is emphasized by the fact of the larger drops and more abundant fall of water immediately after a lightning flash. During a thunder-storm which recently raged in Berks county, Pa., a number of people were stunned, and the air seemed to be charged with electricity to an extent never before known. At several places balls of fire entered private dwellings exploding with fearful sounds.

The amount of water which the sun raises from the earth is estimated at the enormous weight of 37,000,000,000 tons a minute; the quantity of coal required to produce a heat in any way equivalent to the sun's is calculated to be 12,000,000,000,000,000 tons.

French weather predictions last year reached the highest recorded accuracy, 90 per cent proving correct.

When a storm is advancing the wind blows to meet it. Thus a wind blowing from the east or southeast indicates the approach of a storm from the west. When the storm center has passed, however, the wind changes and follows the storm.

A NEW FUEL.—Another cheap and simple fuel discovery is announced in Germany, which possesses advantages that will tend to bring it into universal use. The process which has been patented at Munich, Bavaria, converts turf into a firm and highly valuable combustible material resembling anthracite coal, and burning without smoke or odor. Through a successful combination of several oft-tried processes, the cost of production has been brought down to a point that will admit of a patent turf entering into competition with coal.

PHOSPHORESCENT INFECTION.—The curious discovery has been made that the phosphorescence frequently exhibited by the crustacea is infectious. A French naturalist, M. Giard, lately traced the phosphorescent light in *Talitrus* and other crustacea to bacteria in the muscles, which showed signs of disease. On inoculating healthy individuals, the same luminous appearance was produced. The disease runs a regular course, and the crustacea died in three or four days, the phosphorescence lasting a little after death.

THE ARTIFICIAL PRODUCTION OF RAIN.—An interesting experiment is likely to be soon made by the Agricultural Department on one of the arid regions of the West, the result of an appropriation of $2000 in the Agricultural Appropriation bill, for the purpose of experimenting on the production of rainfall by the explosion of dynamite. Senator Farwell advocated the appropriation, as he believes the project is a feasible one. The plan is to send up 25 pounds of dynamite on inexpensive balloons, the charge to be exploded by time fuses. Both the Senator and Secretary Rusk are credited with the conviction that a succession of these explosions will produce rain. The proposition recalls the efforts of a well-known resident of San Francisco, who, some years ago in Tulare county, essayed to enlist the co-operation of a number of ranchers in trying to produce much needed rain by similar means. His suggestion created a good deal of amusement, and he was subjected to considerable badinage. Military men, however, have frequently remarked that a severe cannonade was followed by rain. The result of the experiment will be watched with interest.

BOILING OF WATER NOT A GUARANTEE OF PURITY.—We are accustomed to be told that the most impure water will be rendered pure by boiling, and that in this we have an absolute safeguard against the danger of water containing disease germs. Now, while it is true that boiling will kill the germs of disease, yet the fact has been brought to our notice, says *Annals of Hygiene*, by so high an authority as Dr. Chas. M. Cresson, that while boiling kills the germs of a particular disease, it yet, in reality, renders the water more impure than it was before, because, by the very death of these germs, dead organic matter is allowed to remain in the water, which is polluted by putrefaction. Hence, while boiling is a most excellent precaution against the occurrence of typhoid fever or similar diseases, when we have occasion to think that the germs of these diseases exist in the water that we drink, yet we must remember that this boiling does not purify the water; it simply removes from it the specific power to produce a specific disease.

IMPONDERABLE ELEMENTS.—We were astonished, says the Newburyport *Herald*, to find that one of the most recent school-books keeps up the old ideas that heat, light and electricity are "imponderable elements;" that is, absolute matter that does not weigh anything. All modern science says that these so-called elements are not matter at all, but that they are simply different kinds of vibrations in matter. It is easy to understand that what we call sound is simply a vibration of particles of matter that address themselves to our ears; that light is another kind of vibration to which the nerves of sensation respond, while electricity is still another form of vibration, or, as it is considered by some scientists, not a different, but a more rapid form of vibration. Just as a friend may take you by the hand and shake you all to pieces, just so electricity shakes and destroys whatever it takes hold of, disintegrating and virtually annihilating the ultimate particles.

RAPIDITY OF THOUGHT.—Prof. Donders of Utrecht recently made some interesting experiments in regard to the rapidity of thought. By means of two instruments which he calls the necmatachograph and the ncernatachometer, he promises some important and interesting results. His experiments up to date show that it takes the brain one .067 of a second to elaborate a single idea. Writing in regard to this, Donder says: "Doubtless the time required for the brain to act is not the same in all individuals. I believe, however, that these instruments may be perfected until we will be able to determine the mental caliber of our friends without our friends knowing that we are testing their aptness." The professor says: "For an eye to receive an impression requires .077 of a second, and for the ear to appreciate a sound .149 of a second is all that is necessary which, however, shows that it acts with nearly double the rapidity of the ear."

ZINC DETERIORATED BY BRICKWORK.—The fact is mentioned in a German newspaper that, under some conditions, sheet zinc, when in direct contact with brickwork, suffers to an appreciable extent from rapid corrosion. It appears from this account that, in building the Berlin city market halls, a portion of the zinc work which rested upon brick walls was found to be deeply pitted in a number of places, this being particularly the case where the metal was close to the bricks. Chemical examination of these results in showing that they contained as high as 1.14 per cent of soluble salts, capable of producing the destructive effects in question, and stimulated to more energetic action by moisture. The proportion of such salts of course varies with different kinds of bricks, while in some there may be nothing to induce any such corrosion. As a preventive, roofing felt or similar material may be placed between the zinc and brickwork.

STRUCTURE OF FLAME.—Prof Dewar, in his lecture, at the Royal Institution, on "Combustion and Flame," produced a "picture" of a flame made by itself, in which its structure was revealed. This was effected by two hook-covers of moistened asbestos. These were suddenly clapped together on the flame, and the result was a picture of the flame in different copper tints.

MINUTENESS IN ASTRONOMICAL WORK.—When Sir John Herschel was defending the character of astronomical science, in view of an error of nearly 4,000,000 miles in estimating the sun's distance, the correction was shown to apply to an error of observation so small as to be equivalent to the apparent breadth of a human hair at a distance of 125 feet.

Good Health.

Health of the State.

The State Board of Health Report for June is at hand. The most 84 localities have made their returns which indicate an improved condition of health throughout the State. The Secretary of the Board, Dr. C. G. Tyrrell, says in his report that "until the official result of the late census is published we have to accept the estimated population as furnished by our own correspondents. The actual death rate is therefore uncertain until we can get the correct number of the population affected. There has been very little zymotic disease reported as particularly fatal, except cerebral fever and cholera infantum, and these in limited number."

Diphtheria and croup have been collectively reported as causing 35 deaths, which indicates a very much lessened prevalence of disease. Twenty-six were from diphtheria and nine from croup. Typhoid fever is mentioned in a limited number of reports, the cases being all sporadic. From this time onward we may look for an increase in this preventable disease, as it seems impossible to educate the public upon the necessity of keeping the premises free from accumulating and decomposing filth. The air they breathe, the food they eat and the water they drink, through becoming contaminated, are dangerous to health. Reports from 84 localities indicate an improved condition of the public health. Disorders of the bowels were prevailing to some extent and some few cases of cholera morbus were noticed; this disease was no doubt induced by eating unripe or unsound fruit or vegetables. Zymotic disease, such as measles, scarlet fever and diphtheria were not prevalent anywhere, and where present were in a mild form without a tendency to spread. Cancer claims 27 deaths, a little short of its usual quota.

The cholera is increasing in Spain and it is not improbable that a lack of sanitary care will permit it to spread throughout Spain and then reach America through the Mediterranean or Eastern ports. It is supposed to have originated from opening the graves of some of the victims of the disease of 1885, and is of so equally virulent type. As it has been proven that cholera cannot prevail where perfect cleanliness is observed, it would be a matter of simple prudence to prepare to defeat any attempted inroad of this disease into California by a general clean-up of cities, towns and villages. Once the disease appears, this measure would be too late. We cannot be sure that cholera will not come to America; we hope it will not, but with the means of prevention so easily applied we would be criminal to neglect the warning thus timely given.

Danger from Electrical Currents.—Medical authorities who have studied the dangers to human life from electrical currents are agreed that this danger has been overestimated, and that the number of fatalities is not as large as represented. A medical journal has combined that electrical currents produce three kinds of severe accidents—instantaneous death, or severe burns, or traumatic neurosis caused by the mental and physical shock. Usually, if the person receiving the shock is burned, he is not killed. Practically, if contact with the wires does not kill, a burn or a harmless shock is the only result. Paralysis of the nerves or nerve centers is very rare. During the last ten years there have been only about 100 deaths in the whole world caused by artificial electrical currents. Taking as a basis of comparison the capital invested, the number of serious injuries met with in the electrical field is not as large as that in other great industries. The number of people killed by asphyxiation from illuminating gas is largely in excess of the number who meet death by coming in contact with heavily charged electrical conductors.—*Electrical Review.*

Sudden Starts, Jerks, Etc., While Asleep.—F. W. C.—Sleep restores vigor and tone to the brain and nervous system, and while one is asleep the muscles and tissues become relaxed. The spasmodic movements are due to nervous reaction for the most part. It is sympathetic sensations for the most part that cause the jumps and jerks that awaken when the person is just falling into slumber. Often external causes, a noise, a touch, the pressure of the bedclothing will produce such effects through the sympathetic nerves. Generally people whose nerves are very active during the day experience these not always pleasant sensations. They receive impressions, consciously or unconsciously, that somehow may revive in the early stage of slumber, and the sleeper catches a glimpse of a dream, in which he seems to be falling or exposed to vague danger, and an instinctive impulse to save himself is expressed in the jump or jerk that arouses to full consciousness.—*Phrenological Journal.*

Nutritive Value of Foods.—Speaking roughly, a quart of oysters contains, on the average, about the same quantity of actual nutritive substance as a quart of milk or a pound of very lean beef, or 1½ pounds of fresh codfish or two-thirds of a pound of bread. But while the weight of actual nutriment in the different quantities of food material named is very nearly the same, the quality is widely different. That of the very lean meat or codfish consists mostly of what are called, in chemical language, proteine compounds or "flesh formers," the substances which make blood, muscle, tendon, bone, brain and other nitrogenous tissues. That of the bread contains but little of these, and consists chiefly of starch, with a little fat and other compounds, which serve the body as fuel and supply it with heat and muscular power. The nutritive substance of oysters contains considerable of both the flesh-forming and more especially heat and force-giving ingredients. Oysters come nearer to milk than almost any other common food. Their values for supplying the body with material to build up its parts, repair its wastes, and furnish it with heat and energy, would be pretty nearly the same.—*Century.*

Bacilli in Celery.—Dr. Charles M. Cresson of Philadelphia states that he has more than once found the typhoid bacilli in the juice that he has squeezed out of celery grown near Philadelphia.

Shop Notes.

Wasting Power.—A prominent machine company, says a contemporary, having extensive business transactions in the different States, some time since took the responsibility of sending experts, equipped with the necessary instruments, to visit a number of the most important manufacturing establishments in various parts of the country, to test the consumption of steam power in each machine, with a view, of course, to determine what proportion was really utilized in the necessary operations of the concern, and how much was unconsciously or carelessly wasted. As a result of this examination nearly all were found to be wasting one-half of their engine's power in doing other than useful work. One prominent establishment was found to be wasting to the extent of 65 per cent of its fuel and power, another was wasting not less than 73 per cent, thus leaving the small amount of 27 per cent of the engine's power for practical use, and another eminent firm, noted all over the West, was using a 60-horse power engine of which not less than 55-horse power was consumed in dead work.

Starting Up a Set of Machinery.—One of the greatest difficulties in running machinery, says the Boston *Journal of Commerce*, especially when it takes some time to get well under way, is a proper method of applying power. The production in some places could be increased one-half if it were possible to bring up the speed gradually instead of slipping on a belt, and let everything start off with a jump. See how this gradually coming up to speed is made use of to this late day by having a heavy fly-wheel on the driving shaft with a belt just tight enough to set the machinery in motion. The driving pulley is left as smooth as possible, and the belt allowed to squeak and squeal for some time till the slipping comes to an end and the machinery reaches its required speed. A good cone-pulley counter-shaft of some kind will put an end to all trouble of this kind and bring the control of the speed within reach of the operator.

The Right Hight for a Vise.—Work at the vise is very often of a delicate character, requiring great exactness and nicety of touch. It is manifestly impossible for the workman to do his best under such circumstances if the natural play of the arms and the body is interfered with by a cramped or strained position. A skilled mechanic knows the intuitively and adjusts his vise experimentally until its hight suits him. But there is a simple and reliable method of getting the proper hight at once, which, we venture to say, few mechanics know. When standing easily at the side of the vise, the tips of the fingers should just touch the chin when the elbow is resting on the jaws of the vise. At that hight body and arms have free play, the touch is most certain and assured, and work far less fatiguing.—*Ironmongery.*

Running Belts.—It is said on good authority that a leather belt is tightened on one side just as much as it is slackened on the other when power is being transmitted by it, so that the sum of the tension on both the slack and tight sides always remains the same. This, says the Boston *Journal of Commerce*, would be true on almost anything else but a belt, or where the stretch is proportional to the amount of load opposed to it, but with belts there is so much of the belting coming in contact with the wheels that it interferes with the amount that is supported in the folds. One of the wheels is running on stretched leather, and the other on belting in its slackest state, changing the condition of the folds for every change in the load it is to carry.

"When a Belt Breaks," says a mule spinner, "take another and slap it on in place of it, and repair the broken one at leisure. I keep a spare belt for every machine in my room, cut the exact length, with the lace holes all made. Did you ever see me square the ends of a belt? I draw it out upon the floor, then double it up to bring both ends together, give it a half turn in twist at the same time to bring the same sides on top, and then out through both ends at once. It will be impossible to get a 'dog-leg' in that joint, no matter how much out of square it may be cut."

Useful Information.

To Strengthen Ropes.—It has been suggested by a French exchange that, in order to insure greater strength and consequently more safety in ropes used for scaffolding purposes, particularly in localities where the atmosphere is destructive of hemp fiber, such ropes should be dipped, when dry, into a bath containing 20 grains of sulphate of copper per litre of water, and kept in soak in this solution some four days, afterward being dried; the ropes will thus have absorbed a certain quantity of sulphate of copper, which will preserve them for some time both from the attacks of animal parasites and from rot. The copper salt may be fixed in the fibers by a coating of tar or by soapy water, and in order to do this, it may be passed through a bath of boiled tar, hot, drawing it through a thimble to press back the excess of tar, and suspending it afterward on a staging to dry and harden. In a second method, the rope is soaked in a solution of 100 grammes of soap per litre of water. The copper soap thus formed in the fiber of the rope is stated to preserve it even better than tar is capable of doing, which acts mechanically to imprison the sulphate of copper, which is the real preservative in the case.

To Estimate Lead in Tin Alloys.—To estimate lead in tin alloys, one gramme of the alloy, which has been rolled out into very thin sheets, is warmed gently with 20 cc. concentrated hydrochloric acid for about half an hour. Bromine water is now added until any undissolved metal is brought into solution, the excess of bromine is expelled by boiling the solution diluted to 100 cc. This is poured into a solution of 40 grammes sodium sulphydrate in 150cc. water, the latter being constantly agitated. After allowing the precipitate to settle, it is filtered and washed with very dilute ammonium sulphydrate. The precipitate and filter are treated in a porcelain dish with 10 cc. concentrated nitric acid, and, after the first violent reaction is over, 5 cc. sulphuric acid are added. Heat is now applied gently until the solution is almost colorless, and the precipitate filtered, washed and weighed. The weighed sulphate of lead is dissolved in basic ammonium tartrate, and any stanic oxide which it may contain is filtered, weighed and subtracted.

A Scientific Mosquito Bar.—Word comes from Paris of the invention of what may be called the alternating mosquito-bar. This consists of a mosquito-net made of extremely fine copper wire woven into a cloth, which is strong and at the same time almost as pliable as a netting made of vegetable fiber. This net is made in the usual form of a canopy, and falls in shining folds about the bed. In the dome of the canopy hangs a small electric lamp. Wires connect the netting with a weak pile battery placed under the bedstead, and by means of a converter are carried into the lamp. The lighted lamp attracts the attention of every mosquito in the neighborhood, and he comes sailing over and lights upon the wire canopy. The battery presses the button, and the mosquito does the rest. M. Scherer, the inventor, says that on the first morning after his net had been put into use, his servant took up 3 22 litres, or nearly three quarts of dead mosquitoes.

The Philosophy of It.—If a teaspoon is placed in an empty glass, boiling hot water can be poured into it without breaking. A fork will not serve the purpose at all, as it is something in the shape of a spoon that concentrates the heat of the boiling water in itself. This is worth knowing by hot water drinkers, as the water is far more palatable in a glass than in a cup.—*Ex.* [The philosophy of our contemporary is probably incorrect. The immunity of the glass from being cracked arises from the fact that the water falling upon the spoon is more largely distributed over the inner surface than when it falls upon the tines of a fork. The glass is crooked only when rapid expansion of the inner surface is produced by the hot water falling upon a small area of surface. The broad surface of the spoon distributes the water—the narrow surface of the tines of the fork fails to do that.—Eds. Press.]

Several Ways of Preventing Ice from Melting too Rapidly.—There are three or four things that will help to keep the precious nugget of ice from melting away, if the housekeeper will only remember them. One is that to keep ice warm is the way to keep it cold. A piece of ice in a pitcher, with a pail over the pitcher and a rug over the pail, will keep all night. A piece of ice in a refrigerator, covered with a snug white blanket, will cheat the greedy iceman every day, and snap saucy fingers at the milk that does not dare to get sour or the beefsteak that dares not fail. These things are admirable in their way, and should be in every hathand, but the greatest trick of all is newspapers. With plenty of newspapers above, below and on every side, the way a piece of ice will keep is a joke.—*Chicago Herald.*

A New Military Drill.—One of the features of military drill in the Russian army is the training of soldiers to swim in battalions, at the same time using their weapons. A large force of infantry swam across a wide lake in full marching order, with the help of fascines made of reeds and rushes or of inflated sheepskins. At the same time they kept up a lively fire on the boats of a supposed enemy who were disputing their passage.

Imitation of Ivory.—A composition for imitation of ivory, for decorative purposes, is made by gently boiling half an ounce of isinglass in a half pint of water till dissolved, then straining and adding flake white (basic nitrate of bismuth and a very little Naples yellow, oxide of lead and satinone). This is to be mixed with rice water and starch powder. Add to the work a final coat, and rub this with fine sandpaper to take off the gloss.

Engineering Notes.

Preventing the Overflow of the Mississippi.

The late extraordinary rise in the Mississippi river, and the imminent danger threatened therefrom, seems to have induced a new and more resolute determination to adopt some preventive measure for such danger in the future. It appears to be universally acknowledged that some more adequate engineering means of defense than the present system of levees for retaining the waters within their natural barriers should be devised and adopted. There are several alternative plans—namely, the provision, in the lower course of the river, of outflow channels, that may be utilized in seasons of threatened floods, and when the volume of the river becomes dangerously swollen; and the provision, along the headwaters of the great river and its tributaries, of great impounding basins, covering great areas, and capable of retaining temporarily the floodwaters, which would be permitted to flow off gradually without endangering the country below, as at present, by its sudden accession to the river.

As the levee system is already in operation for hundreds of miles along the course of the Mississippi, having been developed year by year at enormous cost to the Government, it would be the wisest policy doubtless to maintain these artificial barriers in their present extent, and to supplement their protecting influence by both the engineering expedients above suggested. With these precautions, it is almost assured that the annual destructive floods of the lower Mississippi country would be avoided in the future. The use of embankments alone has been found, in the experience of all countries where the system has been tried, to be extremely hazardous. The gradual rise of the bed of the stream, caused by the deposition of silt, necessitates either continual dredging or the continual elevation of the walls of the embankment.

In China where this primitive system has been practiced from time immemorial, the embankments have had to be carried up so high from this cause, that the surface of the rivers are many feet above the level of the surrounding plains, and the frightful disasters that are periodically reported as being caused by the overflow of the great rivers of that country, can readily be understood. The subject of applying proper remedial measures to control the flow of our great river, it is gratifying to note, is now receiving the anxious attention of the Government engineers, and adequate measures for accomplishing this result will doubtless be adopted and carried into execution at once.

Possibility of the Siberian Railway.—Few people are aware of the enormous possibilities of the great Siberian railway. This road will be the largest single line of railway in the world. The distance from the Ural mountains to its eastern terminus is 4500 miles. Northern Asia is a remote country, yet the construction of the Trans-Siberian railway is a matter in which our great Northwest is directly concerned. It will open up a vast area peculiarly adapted to wheat-raising, a country where the virgin soil and cheap labor will combine to stimulate an immense production. It is quite possible that the Siberian railway will be open for traffic within five years, and agricultural immigration will then be attracted by liberal offers of free land. The Siberian railway will connect with the railroad systems of Russia proper, Finland, Sweden and Norway. Siberia will then become one of the chief grain exporters of the world. We trust that by this time the United States will be well out of the wheat-exporting trade, and that our home consumption will demand the wheat crop of the United States. No nation is so poor as that which is obliged to export raw materials and agricultural products to pay for its imports.

The Ship Railway over the neck of land which separates the head of the Bay of Fundy from the waters of the Gulf of St. Lawrence has been graded for 14 out of the total of 17 miles, and all the rails have been delivered on the line. It is calculated the raising and transfer over the 17 miles can be done in two hours, while the distance saved by the overland trip is about 500 miles. It is expected the ship railway will be finished next year.

The longest railroad bridge span in the United States is the cantilever span in the Poughkeepsie bridge over the Hudson river, 548 feet.

MINING AND SCIENTIFIC PRESS.

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Passing Events.

It is worthy of note that the new mining stock exchanges recently established at several mining centers have adopted a rule that all mines listed shall be first examined to see whether or not they are bona fide properties or "wild-cats." This ought to have been done in San Francisco years ago.

The heaviest fine ever assessed upon a mining company in this State for "contempt" has been imposed upon the Omega Mining Company of Placer county, by Judge Sawyer. The usual fine has been $500, but this time $3000 is imposed.

The mining outlook in Nevada is greatly improved and many mines are again producing. The favorable silver legislation has had much to do with this.

Very active steps are being taken by the Native Sons of the Golden West toward making a grand success of the coming celebration of the 40th anniversary of the admission of California into the Union. San Francisco will be in gala attire during the celebration and thousands will visit the city from the Interior.

A test suit has been commenced in Virginia, Nevada, against the Crown Point Mining Company, to determine whether or not the Comstock Tunnel Company can legally collect the royalty on ore due the Sutro Tunnel Company.

Examining Stock Board Mines.

The several Stock Exchange Boards recently established at various points, such as Kansas City, Helena, Butte, Spokane Falls and Salt Lake City, have adopted new rules for the listing of stocks. It is stipulated that upon a stock being listed a sum of money shall be deposited to defray the cost incurred by the Exchange Board in sending an expert to report upon the property, no exception being made to this rule, save in regular dividend-paying properties. The Exchange Board furthermore reserves the right at any time, to send an expert to examine any property on the list, all such reports to be open for the inspection of all those who may have the privilege of the board. In Montana the fee for listing mining stocks has been fixed at $50 for the first year, and $25 per annum thereafter.

This is a very wholesome rule, and if it is only carried out, it will make the new stock boards much more satisfactory to the public than the old ones. Its adoption has been urged upon our local boards for years past, but they have seen fit to ignore the plan. There is really no guarantee at all offered by the boards that the mines are what they are represented, so that the public has suffered more or less by investing in wild-cat securities. As long as the company paid the listing fee it has been all right, though some sort of office or committee investigation is supposed to be made. There has, however, never been any pretense of actually making an expert examination of the mine itself.

Of course there is still liable to be misrepresentation in such matters where small listing fees are supposed to cover an examination also, for expert investigations are usually expensive. Still, if the Stock Boards send a representative to the mine itself, he can form a pretty good idea about the property, and at any rate can say whether it is a prospect or a mine. On his report, when made public, people can know something about what they are investing in. Such a plan, honestly carried out, will do much to modify existing evils, especially if an expert can be sent at any time it is considered necessary. In such cases he could block dishonest deals and expose fraudulent strikes. It will make mine manipulators more careful, to say the least. Now, if the companies will also adopt a rule providing for black-listing any company having as its manager or director persons who have been found to be tricky in such dealings in other companies, still further progress toward purifying mining stock transactions will be made.

THE MOLDER'S STRIKE.—The examination of James W. Kerr, proprietor of the Occidental Foundry, for killing Edward Cogan, a molder's apprentice, is now going on in the Police Court. The circumstances of the case have already been detailed in the PRESS. A few men are "captured" by the Molder's Union every week, and others are brought from the East by the foundrymen to take their places. The Novelty Iron Works, which were closed before the strike began, and whose owner was not a member of the Iron Founders' Association, have been reopened by members of the Molder's Union and a few men have gone to work there.

FINED FOR CONTEMPT.—A fine of $3000 was this week entered in the U. S. Circuit Court against the Omega Water and Mining Co. of Placer Co. The Omega was one of the hydraulic mining companies enjoined, and it was cited to appear and show cause why it should not be punished, and the Master in Chancery decided that the company had not shown cause for its action. The customary punishment in such cases is $500, but Judge Sawyer in this case levied the heaviest fine—$3000—ever assessed upon mining companies in this State for contempt.

THE ELECTRICAL SOCIETY.—At the meeting of the California Electrical Society this week, Prof N. S. Keith informed the members that a library and laboratory would be necessary to an intelligent prosecution of the work commenced, and that he would solicit contributions for this purpose among those who would be willing to render the society some assistance. He thought that at least $150 should be expended on standard works for the use of the members, and that he could easily raise that amount.

Academy of Sciences.

At the regular meeting of the Academy of Sciences on Monday last, President H. W. Harkness was in the chair. Owing to lack of quorum the three proposals of membership which had been made were laid over to a future meeting.

G. P. Rixford presented the society with some specimens of soda, flies and larvæ, taken from Soda Lake, in the Owen's River valley, and white marble from Inyo county. With reference to this marble, it was stated that D. O. Mills had entered into a contract to use the same in the construction of the first two stories of his new building on Montgomery street.

Thomas C. Johnson, a graduate of the Edinburgh University, through Captain I. E. Thayer presented five cases of rare coral from the Navigator group of islands.

Dr. H. C. Bolton, General Secretary of the American Association for the Advancement of Science, spoke on the history of the Association, and said that the next meeting would be held on the 19th of August in Indianapolis, and would continue one week. This will be its thirty-ninth anniversary, and the incoming President will be George L. Goodale, the well-known botanist of Massachusetts. He hoped the day might not be far distant when an annual meeting might be held here. It was suggested by some of the members present that an effort be made to be have it held in this city two years hence.

White Lead Shipments.

Last week another large shipment of white and red lead was made by Whittier, Fuller & Co. to New York. The comparatively higher prices ruling at the East for white lead makes these ventures a source of profit, and at the same time increases the consumption of raw material, which is quite a desirable item for the mines on this coast which make a large lead output. As the Eastern demand for white lead increases, naturally the consumption of lead will be enlarged here. The factory in this city is a large and well-equipped one, but most of its product has been heretofore consumed here. The possibility of Eastern shipment enlarges its scope and should eventually increase its capacity.

While California itself produces comparatively little lead ore, large quantities come in here from other Pacific Coast States. The mines in Inyo county and thereabouts will be put on their old productive footing before long. The Selby Lead Works, shot tower and Whittier, Fuller & Co.'s white and red lead works are quite flourishing California institutions.

ALVAN CLARKE, the famous telescope-lens maker, states that it will cost an extra $10,000 to grind and polish the big lens for the Spence telescope for the Southern California University, if he does it in this State instead of at his works at Cambridge. Mr. Clarke will visit California in August.

THE Board of Supervisors of Sacramento Co., decline to issue a call for an Anti-Debris Conference but will participate if the Anti-Debris Association calls it. The proposed convention is to consider matters growing out of the alleged operation of hydraulic mines on the tributaries of the Sacramento river.

THE complaint enjoining the county of Yuba and Sheriff Dunster from selling the North Bloomfield hydraulic mine, to satisfy an unpaid contempt fine of $500, alleges that the judgment for contempt was in excess of the jurisdiction of the Superior Court of Yuba county and void.

THE Anaconda Company and the Montana Union Railroad have fixed up a 30-day truce, and several hundred miners who were laid off will return to work at once.

WE are indebted to U. S. Senator A. P. Gorman for a pamphlet on "The Mississippi and its Forty-four Navigable Tributaries," by Alex. D. Anderson.

MR. J. A. FERSON has resigned his position as superintendent of the Union and Keystone Copper mines, at Copperopolis, Calaveras Co.

THE San Francisco Stock Board has declared a dividend of $100 to each member.

The Mount Lyell Glacier.

The fact that the Sierra Nevada bears the record of having formerly been the source of immense glaciers has been recognized by all geologists who have visited the region, but no systematic study of the glacial phenomena displayed throughout a large portion of the range has been carried out. An arduous task, but one of fascinating interest here awaits the geological explorer.

The labors of the geologists of the California Geological Survey has shown that glaciers of great magnitude existed on the high peaks about which Kern and Kings rivers rise. Here are the most southern glacial records that have been reported in the Sierra Nevada, but the extreme southern limit of the glaciated regions has not been definitely determined.

A summary of what is known concerning the living glaciers of the Sierra Nevada will be found in an essay on the existing glaciers of the United States in the Fifth Annual Report of the U. S. Geological Survey. The present ice bodies of the Sierra are small and are but miniature counterparts of the glaciers found in many other regions. They occur mostly in deep cirques on the north sides of the more lofty peaks, and with few exceptions flow northward. Observations made during the survey of the Mono basin show that there are nine small glaciers within the area draining into Mono lake.

At the head of Tuolumne canyon, on the north side of Mt. Lyell, is the largest glacier in the neighborhood of Lake Mono. The accompanying view, taken from the Geological Survey Report, will obviate the necessity of a lengthened description. The moraines now forming about the foot of the glaciers are shown. Each of the ice bodies observed occurs at the head of a deep canyon which was once filled by a magnificent trunk glacier. The largest of these ancient glaciers originated in the amphitheater on the side of Mt. Lyell, and flowed down Tuolumne canyon, forming a veritable river of ice, over 2000 feet deep near its source and about 40 miles long. The present glaciers are perhaps the shrunken remnants of the ancient ice rivers, but they may have had a fresh beginning within quite recent times.

Copper Statistics.

The steady improvement in the position of copper fully bears out the position taken by the MINING AND SCIENTIFIC PRESS about one year ago. The changed condition for the better is not based on a lessened output, but a steady, if not rapid, absorption of accumulated stocks during the French syndicate deal. According to latest English mail advices, for the 12 months ending with June, the stocks, supplies and deliveries in England and France were as follows:

	Stocks. Tons.	Price of Bars.	Supplies. Tons.	Deliveries. Tons.
1890.....	72,493	58¾.	114,892	154 088
1889.....	111,689	41¾.	113 137	73,091
1888.....	72,243	81/.	114,395	94,124

Notwithstanding the large stocks in June, 1889, and heavy deliveries from July 1, 1889, to June 30, 1890, the stocks were only 23,000 tons in excess of the quantities held in stock when M. Secretan and his friends began operations, for which they have since suffered. At the same time bar copper recovered in the London market from £38 in April of 1889 to over £58 at the close of June, 1890.

The statistical position of American copper is equally gratifying. The output of the Lake Superior mines first half the present year aggregated 45,000,000 pounds, or 3,000,000 pounds more than during the like time in 1889. Not only the entire output and considerable of the carry-over has been consumed, but the increased products of other mines have gone into consumption. A year ago there was held in Europe the equivalent of 21,566 tons fine American copper, but the first of the present month there were not 12,000 tons held abroad.

A MURDER occurred on the 1200-ft. level of the Savage mine, on the Comstock, last Sunday. Patrick Crowley, a miner, struck Wm. Nichols, shift boss, on the head with an ax and killed him.

THE Morgan mill has been running steadily on Con. Cal. and Virginia ore ever since October, 1886, and has cleaned in that time nearly 200,000 tons, producing over $4,000,000 in bullion.

The Central San Juan Region.

The accompanying topographical map of the central San Juan region, Colorado, is based upon surveys of Wheeler and Hayden, in part, but embodying many features of the work of Theo. B. Comstock, who has described the section in question before the American Institute of Mining Engineers. The map contains numerous details, with the roads, mines, etc. In the other districts, aside from particular limited areas, there is not great difficulty in laying out mining work intelligently from the outset, for it is quite possible to plot the excavations in advance from instrumental surveys. In the Red mountain area, however, this is commonly impossible. The deposits are not in well-defined linear crevices, but they occupy irregular cavities, apparently related in some general manner (as along a N. E.—S. W. trend) to deep-seated fissures. The vein-stuff is far from uniform, and it is usually of the most complex character. Almost all known mixtures of the sulphides, arsenides and antimonides of iron, lead, copper and zinc are found mingled indiscriminately with varying percentages of the precious metals.

The country is peculiar in the great number of hot springs. The ores are by no means such as could be readily obtained from the adjacent rocks, nor were the hot springs confined to one member of the volcanic series in aggregations of the same kind. It is true that the rhyolitic exposures show different alterations usually from what are found in the hot spring deposits in the trachyte, but there is not a corresponding difference in the percentage of the precious metals, while there are excellent veins in rhyolite which have not been subjected to this recent thermal ocean action. In this small area are locked more secrets connected with the alterations of the tertiary veins than can be solved in many lifetimes, and fortunate indeed will he be who has the best opportunity to investigate here.

The American Belle, Grand Prize and other mines are in gigantic geyser mounds; the Yankee Girl, Guston, Congress, etc., appear to

occupy the bowls of non-sintering springs, and nnmerous other properties show direct relations to the elevations and depressions which give that peculiar aspect to the region which is indescribable, but which would be recognized at once by any careful observer who had ever visited a similar tract of modern origin.

Text of the Silver Bill.

The bill recently passed by both Houses of Congress and signed by the President, and which is now part of the statutes, reads as follows:

SECTION 1. The Secretary of the Treasury is hereby directed to purchase from time to time silver bullion to the amount of 4,500,000 ounces, or so much thereof as may be offered, in each month, at the market price thereof, not exceeding $1 for 371 25 100 grains of pure silver, and to issue in payment for such purchases of silver bullion treasury notes of the United States to be prepared by the Secretary of the Treasury, in such form and of such denominations, not less than $1 nor more than $1000, as he may prescribe, and a sum sufficient to carry into effect the provisions of this Act is hereby appropriated out of any money in the Treasury not otherwise appropriated.

SEC. 2. That the Treasury notes issued in accordance with the provisions of this Act shall be redeemable on demand in coin at the Treasury of the United States, or at the office of any Assistant Treasurer of the United States, and when so redeemed may be reissued, but no greater or less amount of such notes shall be outstanding at any time than the cost of the silver bullion and the standard silver dollars coined therefrom then held in the Treasury, purchased by such notes, and such Treasury notes shall be a legal tender in payment of all debts, public and private, except where otherwise expressly stipulated in the contract, and shall be receivable for customs, taxes and all public dues, and when so received may be reissued; and such notes, when held by any national banking association, may be counted as a part of its lawful reserve; that upon demand of the holder of any of the Treasury notes herein provided for, the Secretary of the Treasury shall, under such regulations as he may prescribe, redeem such notes in gold or silver coin at his discretion, it being the established policy of the United States to maintain the two metals on a parity with each other upon the present legal ratio or such ratio as may be provided for by law.

SEC 3. That the Secretary of the Treasury shall each month coin 2,000,000 ounces of the silver bullion purchased under the provisions of this Act into standard silver dollars until the 1st day of July, 1891, and after that time he shall coin of the silver bullion purchased under the provisions of this Act as much as may be necessary to provide for the redemption of the Treasury notes herein provided for, and any gain or seigniorage arising from such coinage shall be accounted for and paid into the Treasury.

SEC. 4. That the silver bullion purchased under the provisions of this Act shall be subject to the requirements of existing law and the regulations of the Mint service governing the methods of determining the amount of pure silver contained, and the amount of charges or deductions, if any, to be made.

SEC. 5. That so much of the Act of Feb. 28, 1878, entitled "An Act to authorize the coinage of the standard silver dollar and to restore its legal tender character," as requires the monthly purchase and coinage of the same into silver dollars of not less than $2,000,000 nor more than $4,000,000 worth of silver, is hereby repealed.

SEC 6. That upon the passage of this Act the balances standing with the Treasurer of the United States to the respective credits of national banks for deposits made to redeem the circulating notes of such banks, and all deposits thereafter received for like purpose, shall be covered into the Treasury as a miscellaneous receipt, and the Treasurer of the United States shall redeem from the general cash in the Treasury the circulating notes of said banks which may come into his possession, subject to redemption; and upon the certificate of the Controller of the Currency that such notes have been destroyed, and that no new notes will be issued in their place, reimbursement of their amount shall be made to the Treasurer, under such regulations as the Secretary of the Treasury may prescribe, from an appropriation hereby created to be known as "National bank notes' redemption account;" but the provisions of this Act shall not apply to the deposits received under Section 3 of the Act of June 20, 1874, requiring every national bank to keep in lawful money with the Treasurer of the United States a sum equal to 5 per centum of its circulation, to be held and used for the redemption of its circulating notes, and the balance remaining of the deposits so covered shall, at the close of each month, be reported on the monthly public debt statement as debt of the United States bearing no interest.

SEC. 7. That this Act shall take effect 30 days from and after its passage.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

Sylvania District, Inyo County.

EDITORS PRESS:—Thinking that news from this new California camp may interest the mining portion of your readers, I send you the following items: The camp proper, viz: the works, boarding-houses, dwellings, etc., are located in Inyo county, about 46 miles east from Big Pine Station on the Carson & Colorado railroad, almost at the boundary line between California and Nevada, the furnace now building being 500 feet inside the California line.

The Sylvania Mining Co. is composed of Andrew Fife and J. and E. Crocker of Big Pine and is pushing work vigorously to finish the furnace (a 40-ton Pacific water-jacket) and further develop the two company mines, the Liberal and the Climax, which were purchased from W. F. Kincaid. It is thought the furnace will be ready to blow in about the first of August.

The ore developments in the Liberal mine are pronounced by expert galena men to be astonishing, and never before have such vast bodies of galena silver ore been developed with such ease and little expense. The mine shows 12 feet in width of solid cube galena of unknown depth; but already developed to the extent of several thousand tons ready to stope and raise. The Climax shows a chimney of ore on the surface, and is being exploited by a tunnel running to strike the deposit at a depth of 250 feet.

This mining district is a large one, and is comparatively unprospected, except the galena belt on which are about 25 locations exclusive of the two owned by the company. Four of these claims owned by Mr. Frank Buser and son, are pretty well developed, two of them showing very large deposits of cube galena and gray carbonates. Reimas & Co. struck a fine body of carbonate ore in their claims a few days since. In fact there is not a claim upon which work has been done to any extent but what shows fine ore deposits.

The limestone belt (porphyritic lime) is a very large one and extends for miles from northwest to southeast.

There has been on the part of some persons a seeming desire to keep this camp in the background, and representative mining men have not been in to examine the mines.

Six years ago an expert galena miner spent several weeks here, and reported very favorably upon the district, saying that some time in the near future it would be one of the largest and most lasting of all the great galena camps, but not until both silver and lead advanced in price. That time seems now to have come along with the increasing price of the two metals. Our ore is high grade, averaging about 65 ounces silver, and over 50 per cent lead, and one mine belonging to Buser, from which a great deal of ore has been shipped carries over 100 ounces silver, $18 gold and 70 per cent lead.

The camp has only been started for two months, and now has a population of 150, almost every one being employed by the company. Several families have come in lately. Lumber is hard to get, owing to the heavy winter snows in the lumber regions of the Sierras.

A mail line from Big Pine will soon be started, putting the camp in connection with the inside world. B.

Sylvania, via Big Pine P. O., Inyo Co.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. C. HOAG—San Francisco.
SAMUEL CLIFF—San Luis Obispo Co.
C. J. WADE—San Bernardino Co.
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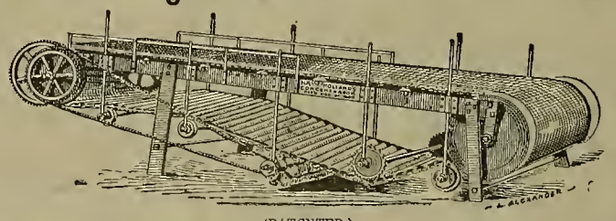

(PATENTED.)

Will save more fine gold and flour quick than any concentrator ever made. Will also concentrate cinnabar and gale a ores perfectly and with economy. The invention is new and possesses all the advantages of the old blanket system, while avoiding its faults by the use of the Corrugated Woolen Belt, which is thoroughly cleaned by means of a revolving brush connected and operated with the machine. It is simple in construction and cannot get out of order. Small power is required to run it.

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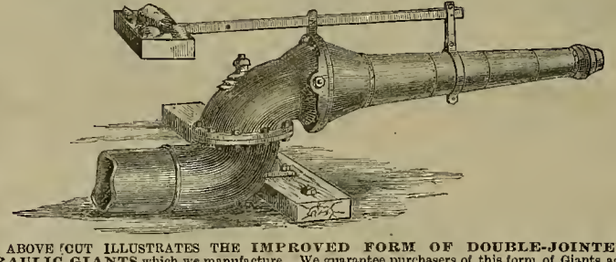

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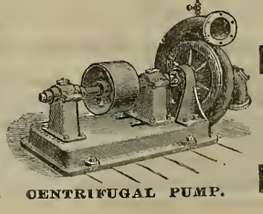

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WORKS:

FIRST and STEVENSON STS., S. F.

The Redwood Forest.

In size of individual specimens, the redwood (*Sequoia sempervirens*) ranks next to its relative, the big tree of the Sierra Nevada (*Sequoia gigantea*) and the eucalyptus of Australia; but if we take the average size of the trees and the density and extent of the forest into consideration, the redwood is the grandest of the world's forest trees. It belongs to the Coast Range of Northern California. A few straggling groves only are to be found below Monterey bay, and it does not extend far into Oregon. The largest body commences at the mouth of Russian river and extends into Oregon. Another large forest lies south of San Francisco, in Santa Cruz county. The widest portion of the great or northern body of redwood timber lies in Mendocino county, between Ukiah and the ocean. Here it is by air-line 25 miles wide—a vast, unbroken forest with branches extending inward up the canyons. The peculiarity of the redwood is its love of moisture, which means here fog. The fog banks rise from the Pacific and flow inland like a great level sea of vapor. The lower mountains next the coast are enveloped, and farther on it fills the canyons, leaving the high mountains to rise like islands out of it. Still farther inland only the lower portions of the canyons are filled with fog. At times the sea of fog will rise so high that it engulfs nearly the whole section back to the high dividing range of mountains which is the watershed between the streams running directly into the ocean and those which flow into the Russian and Eel rivers, which extend for a long distance parallel to the coast line. Then the fog goes pouring through the passes in actual rivers of vapor, which run down the canyons toward the interior. Strangely enough, it always returns as it goes.

Now, with this sea of fog in mind one can locate the redwood belt most accurately. Near the coast on the lower mountains, and everywhere, the densest forest is almost exclusively of redwood. Farther inward sweeps the same dense forest on the lower mountains and in the canyons at the same hight. Redwood forest is still on all the mountains, but of smaller trees, and the greater the elevation the more largely it is mixed with Douglas spruce (Pseudotsuga taxifolia) and the tan bark oak (Quercus densiflora). Still farther inland near the watershed spoken of before, redwood only grows in canyons, and the mountains are either open grazing land, covered with oak and fir, or with that dense low growth known as chemisal (Adenostoma fascicularis). Over the watershed, down those canyons where the fog pours over, there still are groves of redwood, well confined to the moist banks close to the courses of the streams; while up the broad canyons of Eel and Russian rivers the fogs roll and nourish the life of the grandest of all of the redwoods till they are held back by the heat of the interior.

The redwood is not only a lover of moisture, but, to an extent hardly to be believed unless seen, a condenser and conserver of moisture. The tops reach high into the sea of vapor, and a constant precipitation from them like rain takes place. Last summer I was on the coast during a foggy time, and I remember that while the roads were dry and dusty, in the clearings under the redwoods the water had been precipitated till it stood in puddles and formed mud holes. This abundance of moisture causes the densest of undergrowth, which only continual fires make passable. Hazels, huckleberries, various ceanothuses, ferns of large size in the greatest profusion, with large bushes of Rhododendrons and numerous other plants, make the forest floor a perfect tangle in the moister portions. The list of herbaceous plants here is not large, but they are delicate and beautiful. The glossy leaves of Vancouveria hexandra form dense masses; an Orchid, Goodyera Menzieger, is common, and in the spring Trillium ovatum and the Erythroniums are plentiful, and so is the lovely Clintonia.

Of small ferns, only the beautiful Adiantum pedatum, the Maiden-hair, is common; but there are several species of Aspidium and the Woodwardia, and Brake is everywhere, making in the cleared forest a solid mass four or five feet high. I have seen acres of the Brake seven or eight feet high, where a man could only crawl through the tunnel-like paths. Every year or two forest fires sweep through this forest tangle, but it springs up again with renewed vigor. The redwood, unless very young, is not injured by fire. Its thick bark protects it, and often trees will be seen which had every limb stripped by the fire, putting out a mass of foliage from top to bottom. No name could be more appropriate than sempervirens, for it possesses wonderful vitality. A tree cut throws up hundreds of strong sprouts, and a stump is only killed by repeated burning. Fallen trees will often grow along the whole length of the stems, and throw up sprouts from the upturned roots, and I have seen sprouts six or eight feet high from logs. The commonest care would ensure the perpetuity of these grandest of forests.—*Carl Purdy, Ukiah, Cal., in Garden and Forest.*

A CURIOUS FACT.—In some recent experiments the curious fact was established that electrifying a jet of steam decreases its transparency.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 15, 1890.

432,116.—EXCAVATING APPARATUS—H. Casebolt, S. F.

432,373.—DOUBLE-ACTING PUMP—J. M. Clark, Colfax, Wash.

432,119.—WINDOW-SASH HINGE—G. D. Crocker, Oakland, Cal.

432,021.—CULTIVATOR—Wm. Davis, Los Angeles, Cal.

432,121.—SUPPLYING GASES AND LIQUIDS TO MOVING VEHICLES—L. J. De Puy, Phœnix, A. T.

432,133.—WASHING MACHINE—W. H. Gilstrap, Pixley, Cal.

432,307.—LAWN-MOWER ATTACHMENT—R. R. Grimes, Santa Monica, Cal.

432,162.—COVERING FOR PIPES—H. M. Hanmore, Santa Cruz, Cal.

432,140.—SAFETY RELIEF VALVE—A. D. Kilborn, Oakland, Cal.

432,420.—COTTON HARVESTER—J. H. Masters, Stockton, Cal.

432,191.—WIRE-ROPE TRANSMISSION—B. McIntire, S. F.

432,065.—LAWN-MOWER ATTACHMENT—W. C. McQuillen, Los Angeles, Cal.

432,320.—FRUIT-BOILER—Alice W. Miller, Ashland, Or.

432,127.—FUSE-CAP FASTENER—N. W. Moody, Fresno, Cal.

432,146.—WINDMILL—O. W. Parker, Oakland, Cal.

432,336.—EXPLOSIVE COMPOUND—S. D. Smolianinoff, S. F.

432,150.—VEHICLE RUNNING GEAR—Geo. A. Stom, Golden Gate, Cal.

432,217.—SAND-BAND—Jas. Van Curen, Ferndale, Cal.

The following brief list by telegraph, for July 8, will appear more complete on receipt of mail advices:

California—Daniel Best, San Leandro, variable eccentric; Francis A. Bishop, San Francisco, rotary watermeter; Harrison I. Briggs, assignor of three-fourths to A. Myers, J. B. Birdsell, South Bend, Ind. and W. T. Carskadon, Los Angeles, split pulley; Oliver C. Christian, Brodie, steam food cooker; William T. Cottier, Oakland, ventilator; Evert Dewitt, Hanford, windmill; James C. Gould, San Jose, railway cattle guard; George F. Gray, San Francisco, cable railway construction machinery; R. Hall, San Francisco, salve; Arthur C. Harper and C. S. Hamlin, Los Angeles, machine for punching and riveting; Wallace S. Holland, Pasadena, sash or blind holdsr; Robert L. Hottel, Cedarville, middlings purifier; Byron Jennings, San Jose, conduit electric railway; Howard Legge, San Francisco, pencil box; Thomas McConnell, San Francisco, loading elevator; Edward C. Sessions, Oakland, street railway car. Washington—Syrsling W. Baker, Tolalo, stump-puller; Isaac N. Groves, Montesano, lifting jack. Oregon—Charles C. Hogus, Corvallis, water-wheel. Utah—Bernard R. Mayheck, Salt Lake City, assignor of one-half to A. White, Kansas City, Mo., toilet fan.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

VEHICLE RUNNING-GEAR.—Geo. A. Stom, Golden Gate, Alameda Co. No. 432,150. Dated July 15, 1890. This vehicle running-gear consists of a series of elastic springs connecting the front and rear axles, and so disposed as to allow the front axle to be turned without the interposition of a bolster or fifth-wheel.

WASHING MACHINE.—Willis H. Gilstrap, Pixley, Tulare Co. No. 432,133. Dated July 15, 1890. This consists in the novel construction of the air-chamber at each end of the rocking vessel, the guards or screens in said ends, and the rocking connection between said vessel and its bed. The objects of the invention are to provide a washing machine in which the clothes will be limited in their movement within the vessel containing them before reaching the ends of said vessel, while the water will pass through and beyond them; to provide for a chamber at each end in which the air is compressed, and out of which it is driven into and through the clothes in order to better agitate and expand them; to provide a simple and effective means for guiding and holding the rocking vessel on its bed, and generally to provide a washing and churning machine in which, by reason of the peculiar construction of the ends, a perfect agitation of the contents is had.

SAFETY RELIEF-VALVE.—Alden D. Kilborn, Oakland. No. 432,140. Dated July 15, 1890. This invention consists in the combination, with the safety-valve casing, cup-shaped adjusting end and tension spring, of a valve and valve-seat having expansion chambers or grooves formed in the meeting faces thereof. This is an improvement on a patent obtained by the same inventor March 27, 1883, No. 274,787.

SAND-BAND.—James Van Curen, Ferndale, Humboldt Co. No. 432,217. Dated July 15, 1890. This invention relates to the class of devices which are applied to the ends of the wheel-hub in order to protect the bearing or journal from the entrance of dust, sand or mud. The object is to provide a simple and practical protector of this class which is adapted to be readily applied and used in connection with any sized hub.

SELF-LOADING MECHANISM FOR WIRE-ROPE TRANSMISSION.—Bartlett McIntire, S. F. No. 432,191. Dated July 15, 1890. This invention relates to the general class of mechanism included in the system of transportation by means of wire rope, said system being commonly employed in mines where the ore is placed in carriers suspended by clips from a traveling rope or cable, whereby the carriers are transported to suitable points and distances. The object of this invention is to provide for automatically loading the carriers of the endless rope.

DEVICE FOR SUPPLYING GASES AND LIQUIDS TO MOVING VEHICLES.—Louis J. De Puy, Phœnix, Arizona. No. 432,121. Dated July 15, 1890. This invention relates to that class of apparatus adapted for taking gas or liquid from a suitable main or supply receptacle into a vehicle while in motion. The particular purposes to which the invention may be applied are various. Among other things, it may be used for railways adapted to be propelled by water, air or gas, and it is also useful for supplying a moving vehicle with any liquid not necessary for its immediate propulsion, but simply for transportation, such as supplying a tank with oil as the vehicle moves.

WINDMILL.—Orin W. Parker, Oakland. No. 432,146. Dated July 15, 1890. This patent covers certain details of construction in connection with the regulating apparatus for relieving the wheel in case of too much wind.

Assessment Notices.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of Works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of July, 1890, an assessment, No. 18, of 6 cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of August, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 25th day of August, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California Street, San Francisco, California.

GOVER MINING COMPANY—LOCATION of principal place of business, San Francisco, California. Location of works, near Dutch Flat, Placer county, California.

Notice is hereby given that at a meeting of the Board of Directors held on the 14th day of July, 1890, an assessment (No. 2) of twenty-five cents (25c) per share was levied upon the capital stock of the Corporation, payable immediately to the Secretary, at the office of the Company, 13 and 15 Fremont street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Wednesday, the 20th day of August, 1890, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 6th day of September, 1890, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

GRAY DEW, Secretary.

Office, 13 and 15 Fremont St., San Francisco, California.

DELINQUENT SALE NOTICE.

CARMELO LAND AND COAL COMPANY, Location of principal place of business, San Francisco, California; location of works, Monterey county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 1) levied on the Fourth day of June, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
O'Connell, Annie A.	18	100	$50 00
" "	19	100	50 00
" "	20	50	25 00
Green, Wm D.	26	150	75 00
Eddy, Ida I.	15	100	50 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of June, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 10, No. 415 Montgomery street, San Francisco, California, on SATURDAY, the Ninth (9th) day of August, 1890, at the hour of one o'clock P. M., of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

W. T. BAGGETT, Secretary.

Office, Room 10, No. 415 Montgomery street, San Francisco, California.

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About Obtaining Patents.

Patents are Virtually Contracts

The Patent Law provides that in case a patent, which is the evidence of the contract, is not executed in compliance with the requirements of the law, it may be annulled and rendered void. Hence it is of the greatest importance to every inventor that his patent or contract be skillfully and accurately drafted, in order that it may afford him complete protection for his invention during the life of his patent.

How to Procure a Patent.

To avoid all needless delay, however, and secure patents at the earliest moment practicable, inventors will do well to forward a model, drawing or ketch, with a plain, full and comprehensive description of their invention (stating distinctly what the particular points of improvement are), with $15 as a first instalment of fees. If the improvement appears to us to be novel and patentable, the necessary papers for an application for a patent will be prepared immediately and forwarded to the inventor for his signature. When he receives the application and finds it duly prepared, he will carefully sign and return the same plainly addressed to us, with postal money order or express receipt for our own fee. The case will then be promptly filed by us in the Patent Office, and vigorous by prosecuted to secure the best patent possible. [This course is the most expeditious and satisfactory, as no time is lost in transmitting correspondence relative to the preliminary steps.] When the patent is allowed, the inventor will be duly notified, and on sending the final Government fee of $20 to us, we will order the issue of the patent, and forward the same as soon as it is secured from the Patent Office.

The payments are thus divided and made easy. We make no pretense of doing cheap work, in order to entice custom, nor do we afterward make additional charges to bring the bill up to a fair compensation. We do our work honestly and thoroughly, and we never give up a case so long as there is a chance of obtaining a patent. The Agency charge, including drawings, rarely exceeds $40, and for this we do all we can without appealing the case.

Models and Drawings.

Models are now seldom required by the Commissioner of Patents, and generally only in intricate cases. Perfect drawings of practical working machines are more satisfactory to the Patent Office than the old cumbersome system of storing up an immense bulk of commissioned models.

Drawings or sketches, sufficient to illustrate the invention clearly, with a description that will enable us to make a full set of perfect drawings for the Patent Office, is all that we require. A model will answer our purpose as well, however, in cases where the inventor can more easily furnish it.

Secure a Good Patent.

The value and even the validity of a patent often depends on the character, clearness and sufficiency of its drawings. There are thousands of existing patents in which the improvements are but partially or poorly illustrated in the drawings. When an attempt is made to dispose of such patents, the vagueness and defects of the drawings often prejudice capitalists and manufacturers against the invention, while in reality it may be of great value, and would meet with ready sale had it been skillfully, completely and artistically portrayed. In all cases prepared by us, the drawings are made under our personal supervision, by skilled draftsmen in our constant employ, and every precaution is taken to have the invention fully and clearly shown by different views, so that the improvement will be readily understood by the Examiners in the Patent Office, and comprehended by the public when the patent is granted.

Advantages to Inventors on the Pacific Coast.

The firm of DEWEY & CO. has edited and published the MINING AND SCIENTIFIC PRESS continuously since 1860—a period of 30 years. Few agents, who are still engaged in the business, have had so long-extended practice in patent soliciting. The members of the firm give personal attention to the applications intrusted to their care; and their familiarity with inventions and with local affairs in the Pacific States and Territories enables them to understand the wants of inventors on this coast more readily and thoroughly as we believe, than any other agents in America. Thus there is saved a great deal of the time which ordinarily, when distant agents are employed, is wasted in preliminary writing back and forth.

This happy combination of long business experience together and wide connections has placed our firm in a position unquestionably most fortunate for affording inventors prompt and reliable advice, and the best facilities for securing their full patent rights with safety and dispatch at uniformly reasonable rates.

Every patentee of a worthy invention is guaranteed the gratuitous publication of a clearly stated and correct description of his invention, in one or more of our influential and reliable newspapers, affording just the circulation best calculated to widely inform the class of readers especially interested in the subject of his invention.

Caveats.

A Caveat is a confidential communication made to the Patent Office, and is therefore filed within its secret archives. The privilege secured under a caveat is that it entitles the caveator to receive notice, for a period of one year, of any application for a patent subsequently filed, which is adjudged to be novel and is likely to interfere with the invention described in the caveat, and the caveator is then required to complete his application for a patent within three months from the date of said notice. Caveat papers should be very carefully prepared. Our fee for the service varies from $10 to $20. The Government fee is $10 additional.

To enable us to prepare caveat papers, we require only a sketch and description of the invention.

Rejected Applications.

Inventors who have rejected cases (prepared either by themselves or for them by other agents) and desire to ascertain their prospects of success by further efforts, are invited to avail themselves of our unrivaled facilities for securing favorable results. We have been successful in securing Letters Patent in many previously abandoned cases. Our terms are always reasonable.

Inventors doing business with us will be notified of the state of their application in the Patent Office whenever it is possible for us to furnish such information.

DEWEY & CO.,

Patent Solicitors, Office of SCIENTIFIC PRESS, 220 Market St., Elevator entrance, No. 12 Front St., S. F.

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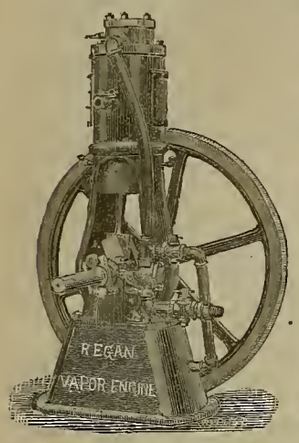

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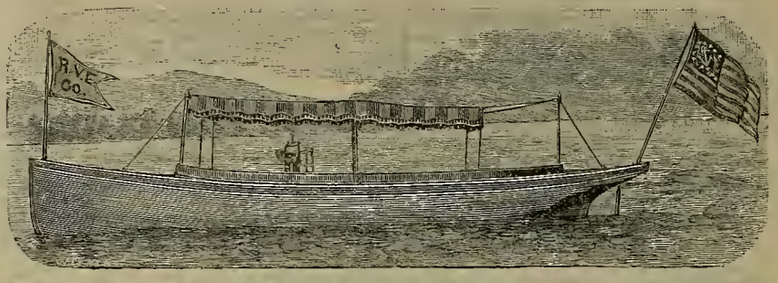
GEORGE HAAS, 824 Market St., Phelan Building, } SAN FRANCISCO, Feb. 21, 1890. }

REGAN VAPOR ENGINE CO.—Gentlemen: The 2 H. P. Engine you put up in our factory last November, has given satisfaction beyond my expectations. It does my work better than than those two Electric Motors did, with scarcely any expense for gas. I paid the Motor Company $25 per month for power, while the Vapor Engine has cost me but $2 per month so far. But, be it understood, I have not used the Engine as much as in summer, but the cost of motor would have been all the same, making a saving of $69 in three months. I am satisfied the Engine will pay for itself in less than two years. I use it for freezing cream, run three fans, cocoanut grater, etc.
Yours truly, GEO. HAAS.



Regan Vapor Launches

The uses for small steamboats and launches are innumerable; they are convenient and serviceable for transportation, and are a source of pleasure for those who are fond of sailing. But many have been deterred from purchasing such boats, because of the trouble and inconvenience of using coal, and the necessity of obtaining a Government license, engineer, etc. Our motor does away with these objections. The small space taken up by our engine in the boat **gives more room**; the boat will seat **twice** as many persons as one the same size fitted up with a steam engine. It takes only **two minutes to get under headway**, and can be stopped when running at full speed within the length of the boat, the reverse motion being instantaneous and effective. We carry in stock six regular sizes of hulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos. Kane & Co., Racine, Wis.

REGAN VAPOR ENGINE CO., 221-223 First St., San Francisco, Cal.

The Pittsburgh Boiler Scale Resolvent.

☞This Resolvent IS NOT AN EXPERIMENT but a FACT, and it will do the work claimed for it at a LESS EXPENSE than any other boiler purge, AND IN NO MANNER INJURE THE IRON.

CARNEGIE BROTHERS & CO., PROPRIETORS OF EDGAR THOMSON STEEL WORKS, } PITTSBURGH, PA. WORKS AT BRADDOCK. Oct. 4, 1887. }

We use the Pittsburgh "Boiler Scale Resolvent," and are well satisfied with the results obtained. We have tested nearly all Compounds presented to us, and this one **is the only good thing we have ever used.** Our feed-water is heated in Berryman Heaters, but owing to distance of heaters from boilers, we rarely exceed 150 degrees of heat in feed-water.

Our water is of the worst character, containing such bad impurities as **sulphate of lime, carbonate of lime, mud, and everything that is bad.** Very truly yours, WM. R. JONES, Gen. Supt.

No water in the United States produces scale in greater quantity or of a harder nature than the Monongahela River, containing SULPHATE and CARBONATE of lime, iron, MAGNESIA, SILICATE, SULPHUR, ALUMINUM, etc. The following well-known manufacturers, who are large steam users IN PITTSBURGH, and using the water from said river as boiler-feed for all their boilers, USE THIS RESOLVENT in their steam plant, and to whom reference is hereby made: Carnegie Brothers & Co., Proprietors of the Edgar Thomson Steel Works; Dilworth, Porter & Co.'s Spike Works; and Oliver and Robert's Wire Co.; and many other firms in the great manufacturing center WHERE THE RESOLVENT IS MADE. Reference is also given to Robert McMahon, Boiler Inspector for Alleghany Co., Penn., and to the following Railway Companies who use it on their locomotives: Kansas City, Fort Scott & Gulf Railroad; Central Iowa; Mexican Central; Delaware, Lackawanna & Western; Burlington, Cedar Rapids & Northern, Terre Haute & Indianapolis; Mexican National; and Denver & Rio Grande Western.

Upon receipt of order, WITH THE PROMISE OF FAITHFULLY CARRYING OUT THE PRINTED DIRECTIONS, we will furnish, FOR FIRST INTRODUCTION, a Barrel, or Half Barrel, of the Resolvent, and the invoice will bear the following stamp:

{ TO BE PAID FOR WHEN RESOLVENT PROVES ENTIRELY SATISFACTORY. }

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TATUM & BOWEN,

Sole Agents for the Pacific Coast,

Dealers in Improved Wood-Working Machinery

Saw Mill Machinery, Engines, Boilers, Iron-Working Machinery, Supplies, Etc.,

Sole Agents for Hoe Chisel-Tooth Saw, Gardner Governor, Schultz Leather Belting, Etc., Etc.

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☞If in want of Machinery of any description, write us for Descriptive Circulars and Prices.

ATLAS IRON WORKS,

THE ATLAS ORE CAR.

J. B. JARDINE,
General Manager,
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Manufacturers and Builders of all kinds of

Mill & Mining Machinery,

Indicators, Steam Engines, Steam Boilers, Water Wheels, Hoisting Engines, Hoisting Works, Hoisting Derricks, Boom Derricks, Coal Winches, Hoists and Elevators, Dredgers, Excavators and Ditching Machines.

This car is lined with steel, and will dump right or left. Has steel axles.

CONTRACTORS' MACHINERY
A Specialty.

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L. C. MARSHUTZ T. G. CANTRELL.

NATIONAL IRON WORKS

N. W. Corner Main and Howard Sts., San Francisco,

—MANUFACTURERS OF—

Stationary and Compound Engines, Flour, Sugar, Saw and Quartz Mill Machinery.

AMALGAMATING MACHINES. CASTINGS AND FORGINGS Of Every Description

ALL WORK TESTED AND GUARANTEED.

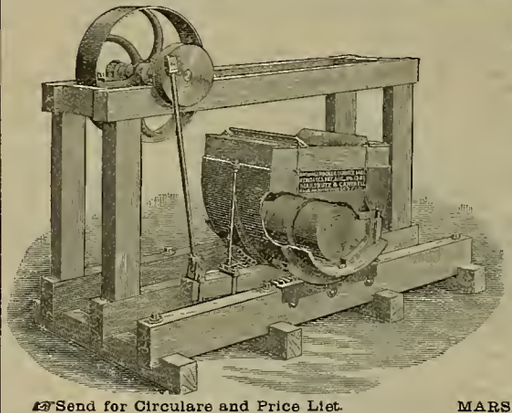
IMPROVED PORTABLE HOISTING ENGINES.

NATIONAL ROCKER QUARTZ MILL.

KENDALL'S PATENT, AUGUST 24, 1886.

CAPACITY. 12 Tons in 24 Hours. 3 H. P.

MARSHUTZ & CANTRELL, Sole Manufacturers.



The Patentee and Manufacturers cordially invite miners to critically examine and pass judgment upon this improved system of milling and amalgamating ores in the following particulars:

1. The cost is less than one-half of stamps of same capacity.
2. The freight to mine is less than one-half of stamps.
3. The cost of erecting is less than one-fourth of stamps.
4. The power to drive it is less than one-half of stamps.
5. The wear is less than one-quarter of stamps.
6. There is no wear except on shoes and dies.
7. In point of amalgamation it is superior to any other machine in use.
8. In its simplicity of construction.

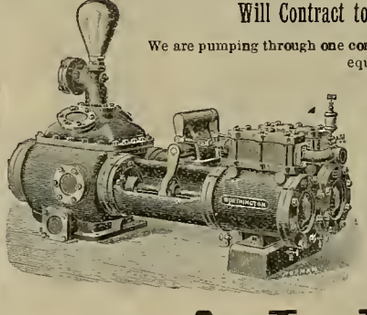
We challenge competition with Stamps, Ball Pulverizers or and other ore crushing machines now before the public.

☞Send for Circulars and Price List. MARSHUTZ & CANTRELL.

WORTHINGTON STEAM PUMPS!

Will Contract to Pump any Elevation at One Lift.

We are pumping through one continuous line of pipe 114 miles long against a pressure equal to 3500 feet elevation.



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Than all other Manufacturers in the United States Combined.

WE BUILD PUMPS FOR EVERY PURPOSE FOR WHICH PUMPS ARE USED,
And against pressures up to 8000 pounds per square inch.

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Pacific Coast Sales Agent,

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—ALSO AGENT FOR THE—

NATIONAL WATER PURIFYING COMPANY

Having the largest Artificial Plants in the United States in operation in Philadelphia and Chattanooga having changed the next best system, in several instances, to the National. Any capacity guaranteed.

AMALCAMATING MACHINERY.

Stamp Mills for Wet or Dry Crushing, Huntington Centrifugal Quartz Mill, Drying Cylinders, Amalgamating Pans, Settlers, Agitators and Concentrators, Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

FRASER & CHALMERS, MINING MACHINERY

CONCENTRATING MACHINERY.

Blake, Dodge and Comet Crushers, Cornish Crushing and Finishing Rolls, Hartz Plunger and Collom Jigs, Frue Vanner & Embrey Concentrators, Evans', Calumet, Collom's and Rittenger's Slime Tables, Trommels, Wire Cloth and Punched Plates, Ore Sample Crinders and Heberle Mills.

IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. BOILERS HORIZONTAL, VERTICAL ... AND SECTIONAL....

IMPROVED STEAM STAMPS

Hoisting Engines, Safety Cages, Safety Hooks,

ORE CARS, WATER & ORE BUCKETS,

Air Compressors, Rock Drills, Etc.

GENERAL MILL AND MINING SUPPLIES, ETC.

Sectional Machinery FOR MULE-BACK TRANSPORTATION.

Pumping Engines and Cornish Pumping Machinery,

IMPROVED WATER JACKET

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SLAG CARS AND POTS,

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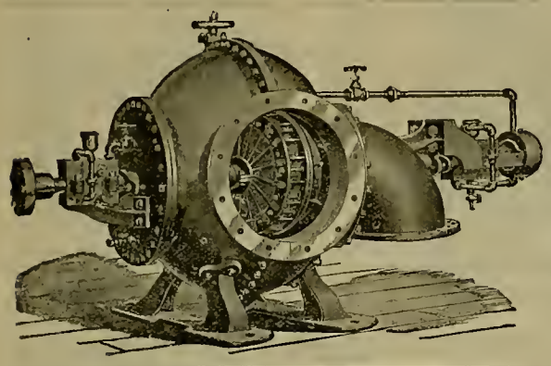

JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted to capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,
Springfield, Ohio, or 110 Liberty St., New York.

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ANNUAL CAPACITY 800. ESTABLISHED 1831.

LOCOMOTIVE ENGINES!

Adapted to every variety of service, and built accurately in standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Broad and Narrow Gauge Locomotives, Mine Locomotives by Steam or Compressed Air, Plantation Locomotives, Noiseless Motors for Street Railways, Furnace Locomotives, etc.

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For information concerning this process for the reduction of Ores containing precious metals, and terms of license, apply to

THE RUSSELL PROCESS CO.,
Park City, Utah.

GRANGER'S ROLLER STAMP MILL

Beats them all. Works dry ores. Makes even granulation. No dead work, hence minimum wear.

A. P. GRANGER, Denver, Colo.

GRANGER'S DRY ORE SEPARATOR

The very best. Uses no water. No freezing up. Saves hauling waste. Saves high percentage. Send for circulars.

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COMPLETE STEAM PUMP
10 SIZES FROM $7 TO $75
FOR WATER SUPPLY TANKS, FIRE PUMPS & ETC.
WRITE FOR PRICES AND DESCRIPTIVE CIRCULARS
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SOLE MAKERS
CINCINNATI, O.

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ESTABLISHED 1866.

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HENRY G. HANKS,
Practical and Industrial Chemist, Assayer and Geologist,

718 MONTGOMERY ST., - SAN FRANCISCO.

☞ Will report on the condition and value of any mining property on the Pacific Coast. Rare Chemicals made to order. Instructions given in Assaying and Practical Chemistry

THOMAS PRICE & SON,

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BULLION ROOMS and ORE FLOORS,

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COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.

WORKING TESTS OF ORES BY ALL PROCESSES.

SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

SELBY
SMELTING and LEAD CO.,
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GOLD AND SILVER REFINERY
And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

....MANUFACTURERS OF....
BLUESTONE,
LEAD PIPE,
SHEET LEAD,
SHOT, Etc., Etc.

ALSO MANUFACTURERS OF
Standard Shot-Gun Cartridges,
Under Chamberlin Patent.

JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

63 & 65 First St., cor. Mission, San Francisco.

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents for the Morgan Crucible Co., Battersea, England. Also for E. G. Denniston's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.

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Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,
Near First and Market Streets, S. F.

C. A. LUCKHARDT, Manager. ESTABLISHED 1869.

Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.

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Mining Engineers and Metallurgists

GREAT REDUCTION!

BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.

PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut or hurred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

San Francisco Pioneer Screen Works,
231 & 223 First St., San Francisco, Cal.

JOHN W. QUICK, Proprietor.

WINCHESTER HOUSE,

44 Third Street, - San Francisco, Cal

This Fire-proof Brick Building is centrally located, in the healthiest part of the city, only a half block from the Grand and Palace Hotels, and close to all Steamboat and Railroad Offices.

Laundry Free for the use of Families.

HOT AND COLD BATHS FREE.

Terms, Board and Room, $1.00 per Day
And Upward.

Rooms with or without Board.

Free Coach to the House

J. POOLEY.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 24, 1890.

General trade the past week was quiet. Wholesale merchants are receiving goods for the fall trade. With manufacturers a cheerful feeling is reported, as the outlook promises renewed activity this fall.

The money market is fairly easy. Remittances from the interior are free. For moving the cereal crops, the demand for fundsshows a steady increase.

The British steamship Gaelic hence July 19th for China took out the following treasure: Mexican dollars, $147,813; gold coin, $27 374; gold dust, $180; total, $175,367.

MEXICAN DOLLARS—The market has held strong. Since the steamship Gaelic sailed for China, the demand has been light. The market is quotable at 87½@88 cts.

SILVER.—The market held in London at 50d. up to Monday,when the price was advanced to 50¼d., but has since fell back to 50d. The New York market fluctuated more than did the London market. It now begins to look as if speculators abroad and those in this country had exerted their influence to keep silver from being remonetized, for as a commodity the metal is a good gamble. No wonder can be now expressed why London *Money* stated that the Rothschilds and other leading European speculators want to keep silver as a commodity, for it, and all securities whose values are based on that metal's market price, can be made to fluctuate to a much better advantage. The advance in silver in this country and England has caused a corresponding advance in Germany. Russia's silver rouble has advanced to proportionately higher figures than has silver. This advance is due to a demand for roubles to pay for Russian wheat. The advance in the price of silver in Germany is convincing evidence that the price abroad will keep pace with the advance in this country. The local market has held steady at $1.09½, Mint price. Considerable quantities were placed at that figure.

QUICKSILVER.—Receipts the past week aggregate 176 flasks. The market has held fairly firm under a moderate demand and fairly liberal supplies.

BORAX—Exports by sea the past week aggregate 400 lbs. to Victoria. In last month there was sent East by railroad 16,396 centals. The market is steady at current quotations.

LIME—Receipts the past week aggregate 3982 bbls. The local consumption is only fair, while the shipping demand is light.

LEAD—The market is easy but no lower. Eastern mail advices report an unsettled market. There is an impression at the East that silver-lead ores, which are reported to have been stacked up pending silver legislation, will be worked soon.

TIN—The market for spot is dull but no lower. English advices report an active demand for plate on California orders. The East reports a more bearisb feeling.

COPPER—There was shipped in last month by overland railroad 235 centals of copper cement. The market is very strong with still higher figures looked for. The statistical position (see remarks given in the editorial department) of the metal is in favor of the holding interests.

IRON—Imports the past week aggregate ten tons from Oregon. The market for spot, to arrive and shipment is in sellers' favor. English advices indicate better prices soon. Eastern advices report the markets dull but fairly steady. Nearly all the Southern furnaces were blown in owing to hot weather, but they will go into blast with cooler weather. In some parts of the South labor trouble, and at other places a lack of ore and coke is being felt.

COKE—Imports the past week aggregate 100 tons from London. The market is easy.

COAL—Imports the past week aggregate as follows: Seattle, 1200 tons; Tacoma, 780; Nanaimo, 4446; Departure Bay, 2050; Coos Bay, 1100; Comox, 2350; total, 11,926 tons. The market is very strong for all positions. There is a difference in opinion regarding the outlook, but the majority of dealers are inclined to the opinion that higher prices are altogether probable when the winter demand sets in. The list of vessels on the way from and to load at Australian ports is gradually growing.

Mining Share Market.

The mining share market held strong up to Saturday, when, under bear points and systematic cross orders, it began to set off resulting in a 10 per cent cut in prices after 2:30 session on Monday. This was followed by a slight reaction on Tuesday, at the 9:30 session, but after the Call another decline set in, Ophir, Con. Virginia and other North End stocks suffering the most. At the close of the informal session the market looked as if it was going all to pieces, which caused many to sell in expectation of another decline. At the 2:30 session, the market opened with Ophir scoring an advance of 20 per cent; this caused the neighboring stocks to appreciate in sympathy. This hull movement came unexpectedly, for there were no signs of it at the early informal session in the Pacific Stock Exchange. The jump, of course, was one of those mysterious movements which indicate more shorts on the market than ore in the mine, or at least, more than the management is likely to show up. The Gold Hill stocks have been dull and heavy. The delaying of the starting of the pumps and little doubt of more assessments soon are the unfavorable influences at work on Crown Point, Yellow Jacket, Overman, Challenge and other mines at that end. In the outside stocks trading has been light. The present impression on the street is that there will be nothing much in the Comstocks until about September, and some say not until October, when quite a bull move can he expected. In the meantime there will be ups and downs, or a good trading market.

The mining share market opened this (Thursday) morning dull but steady. After regular Call, Ophir and the other North End stocks made quite an upward movement, but the Middles shaded off, while the Gold Hill were barely steady. It looks very much as if the market is fluctuating to higher figures so the pool can unload at a good profit; for during the late depression the outside were free sellers.

From the Comstock mines our advices could not be of a more encouraging character. Active prospecting work is going on in all the mines, but particularly in the Middle and Gold Hill groups. With so much active work it would be singular if valuable strikes of ore in one or more of the mines is not made much within the next 30 days. Ophir has several hundred tons of rich ore in the ore houses; and, it is claimed that the management can take out more ore as soon as desired. The work going on in this mine, Con. Virginia, Mexican, Sierra Nevada, Union and Utah deserves close watching. In Best & Belcher they ought to be nearing the ore lying to the southwest, near the Con. Virginia line. In Savage active work is being done to develop the late find in the 1300 north drift. The shaft is being repaired and sunk to that level, while a winze is being sunk in ore to the 1400-foot level, where drifts and crosscuts will be run. In Hale & Norcross more active prospecting work is under way. The company has laid off about 50 men pending repairs to the shaft. Official advices report that the Potosi 1030 south drift is being pushed ahead in good ore. In Exchequer, Alpha, Con. Imperial, Challenge, Confidence and Yellow Jacket active work is still the order. From Crown Point official advices report the 300 south stope narrowing but the 300 east stope is widening. The battery assays are $3 a ton higher, while Belcher's battery assays are $11 higher. Active prospecting work is being done in the mine. In Seg. Belcher they have taken up the Belcher south drift, which at last advices was in vein material.

From the outside mines continued good reports come to hand from the Tuscaroras and Quijotoas. The Mount Diablo mine reports are of the most favorable character; the battery assays are over $43 a ton, and tailings over $5 a ton.

Reliable private advices received to-day from Virginia report a decided improvement in both Savage and Potosi.

San Francisco Metal Market.

	WHOLESALE. THURSDAY, July 24, 1890.	
ANTIMONY	22½@	—
BORAX—Refined, in carload lots	8 @	—
Powdered " " "	8 @	—
Concentrated " " "	7½@	—
All grades jobbing at an advance.		
COPPER—		
Bolt	23 @	25
Sheathing	23 @	25
Ingot, jobbing	20 @	—
Fire Box Sheets	23 @	25
LEAD—Pig	4½@	5
Bar	5½@	—
Sheet	7 @	—
Pipe	6½@	—
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 65 @	—
Buck, ₱ bag	1 85 @	—
Chilled, do	2 05 @	—
QUICKSILVER—By the flask	58 00 @	—
Flasks, new	— @	—
Flasks, old	45 @	55
TINPLATE—B. V., steel grade, 14x20, to arrive	— @	—
B. V., steel grade, 14x20, spot	4 80 @	—
Charcoal, 14x20	6 75 @	7 00
do roofing, 14x20	6 00 @	—
do, do, 20x28	12 00 @	—
Pig tin, 5@6, ₱ lb	23½@	—
CHROME IRON ORE, ₱ ton	10 .0@	—
IRON—Bar, base	3 @	3½
Norway, base	4½@	5½
STEEL—English, lb	16 @	22
Cauton tool	9 @	9
Black Diamond tool	9 @	9
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—
	Spot.	To Load.
IRON—Glengarnock ton	34 00 @ —	30 @ —
Eglinton, ton	34 00 @ —	30 @ —
American Soft, No. 1, ton	— @32 00	33 @ —
Oregon Pig, ton	— @33 00	— @ —
Puget Sound	34 00 @ —	— @ —
Clay Lane White	— @28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	— @ —	- @ —
Langloan	34 00 @ —	30 @ —
Thorncliffe	34 00 @ —	30 @ —
Cartsherrie	34 00 @ —	30 @ —
Barrow	34 00 @ —	30 @ —
Thomas	33 00 @ —	— @ —
Cargoficet	30 00 @ —	26 @ —

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 23.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	.50	1 09	$10 75	$4 50	$21 40
Friday	.50	1 09½	16 75	4 50	21 30
Saturday	.50	1 09½	16 75	4 50	21 35
Monday	.50½	1 09½	17 00	4 50	21 20
Tuesday	.50½	1 09½	17 00	4 50	21 00
Wednesday	.50	1 09½	17 50	4 50	20 95

NEW YORK, July 23.—Borax steady at unchanged quotations. Quicksilver—market strong at 75@76c, in sympathy with a better market abroad. Lake Copper early in the week sold to the extent of 500,000 lbs. at 17c, but to-day it is strong at 17½c; Arizona is 15½@16½, and casting 14½@15c. Pig Lead is slow.

Lumber.

Pine, Fir and Spruces.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 50	$18 00
41 to 50 ft	21 50	19 00
51 to 60 ft	23 50	21 00
61 to 70 ft	27 50	25 00
1x3, fencing	22 50	20 00
1x4, "	21 50	19 00
1x3, 1x4 and 1x6, odd lengths	19 50	16 00
Second quality	17 50	15 00
Selected	25 50	23 00
Clear, except for flooring	31 50	29 00
Clear for flooring	31 50	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	11 00	10 00
Dressed Pine, flooorring, No. 1, 1x6	33 00	30 00
No. 1, 1x4	37 50	35 00
No. 1, 1¼x4, 1¼x6, and odd sizes	38 50	37 50
All sizes, No. 2	29 00	24 00
Stepping, No. 1	43 00	42 50
Stepping, No. 2	33 00	25 00
Ship timber and plank, rough	27 00	19 00
Selected, planed 1 side, avge 40 ft	29 00	25 00
" " 2 " " "	31 00	29 00
" " 3 " " "	33 00	31 00
" " 4 " " "	35 00	33 00
Deck plank, rough, average 35 ft	35 00	33 00
Dressed, average 35 feet	40 00	35 00
Pickets, rough, B. M	20 00	10 00
½x1½, 4 ft long, ₱ M	6 50	4 25

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Almont M Co	Arizona	2	½	July 12	Aug 13	Aug 30	S Harman, 302 Montgomery St
Belcher M Co	Nevada	49	50	June 27	July 31	Aug 21	C L Perkins, 327 Pine St
Bodie Cons M Co	California	12	25	June 16	July 22	Aug 22	B. L. Burling, 309 Montgomery St
Boua Fors M Co	California	1	5	June 19	Aug 10	Sept 5	F K Taylor, 12 Montgomery St
Cons Imperial M Co	Nevada	28	5	July 17	Aug 20	Sept 11	C L McCoy, 329 Pine St
Cons Pacific M Co	California	12	10	Jun 21	July 28	Aug 20	F P Luty, 330 Pine St
Crescent M & M Co	California	4	25	Jun 24	Aug 2	Aug 29	J H Isham, 310 Pine St
Crocker M Co	Arizona	9	15	June 16	July 25	Aug 25	N T Messer, 309 Montgomery St
Cruikshank G M Co	California	1	10	Jun 27	Aug 14	Aug 25	E J Koch, 211 Sansome St
Exchequer M Co	Nevada	29	25	July 10	Aug 14	Sept 4	O U Elliott, 309 Montgomery St
Golden Prize Con M Co	Nevada	4	25	Jun 19	July 30	Aug 18	C D Bennett, 330 Pine St
Gover M Co	California	2	25	July 15	Aug 20	Sept 6	Gray Dew, 13 and 15 Fremont St
Gray Eagle M Co	California	18	6	July 1	Aug 4	Aug 25	J M Buffington, 303 California St
Mayflower Gravel M Co	California	47	30	June 7	July 10	July 31	J Mo izio, 328 Montgomery St
Silver King M Co	Arizona	3	50	June 9	July 17	Aug 11	A Waterman, 309 Montgomery St
Standard Cons M Co	California	3	50	June 2	July 15	Aug 14	J W Pew, 310 Pine St
Tierakoff G M Co	California	4	1	June 9	July 26	Aug 23	W J Garnett, 308 Pine St
True Cons M Co	California	9	2	May 26	July 21	Sept 15	J C Bates, 434 California St
Union Cons M Co	Nevada	41	28	July 21	Aug 26	Sept 15	A W Barrows, 303 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Benton Cons M Co	California	V B Allen	330 Pine St	Annual	July 30
Derbee Blue Gravel Co	California	T Wetzel	522 Montgomery St	Annual	Aug 5
Lady Washington Cons M Co	Nevada	L Osborn	309 Montgomery St	Annual	July 30
New York Cons M Co	Nevada	C E Elliott	309 Montgomery St	Annual	Aug 2
South Feather Union M Co	California	A Halsey	328 Montgomery St	Annual	Aug 1

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gato	309 Montgomery St	25	Apr 5
Caledonia M Co	Nevada	A S Chemnan	08	1	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	Jun 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	July 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 3.		WEEK ENDING July 10.		WEEK ENDING July 17.		WEEK ENDING July 24.	
Alpha	1 30	1.70	1.35	1.5	1.30	1.40	1.25	1.40
Alta	1.30	1.50	1.25	1.40	1.25	1.3.	1 15	1.25
Andes	.65	.83	.65	.70	.60	.70	.60	.75
Belcher	2.50	3.50	2.75	3.30	2 80	3.15	2.55	2.95
Best & Belcher	3.15	4.20	3.35	4.50	3.75	4.25	3 65	4.20
Bullion	3.40	4.15	3.25	3.70	3.15	3.65	3.55	4.15
Bodie Con	.85	1.10	1.10	1.45	.85	1.10	1.05	1.20
Bulwer	.25	.35	.25	.35	.25	.30	.25	....
Commonwealth	3.55	....	....	....	....	3 45	3.50	....
Con. Va. & Cal	4.75	5.25	4.55	4.75	4.00	4 60	3.75	4.20
Challenge	2.80	3.60	2.75	3.50	2.90	3 15	2.75	3.0
Chollar	3.50	4.60	3.75	4.15	3.65	3.95	3.70	4.00
Confidence	6.00	7.25	7.25	8.00	6.70	7.37	....	....
Con. Imperial	.35	.50	.40	.45	.40	....	.30	.40
Caledonia	.40	.65	.50	.55	.45	.50	.40	.45
Crown Point	2.80	3.45	2.70	3.25	2.80	3.15	2 65	3.00
Silver	....	.20	....	.20	....	....	.20	.30
Del Monte	1.40	1.50	1.40	1.70	1.55	1.30	1.50	1.65
Eureka Con	....	....	....	....	4.00	4.25	4.50	....
Exchequer	.95	1.35	1.00	1.20	.85	.95	.85	1.05
Graud Prize	.60	.70	.65	.70	.50	.65	....	....
Gould & Curry	2.25	3.15	2.30	2.80	2.55	3.05	2.60	2.95
Hale & Norcross	2.70	3.55	2.95	3.50	3.00	3.30	2.75	3.10
Julia	.30	.35	.25	.30	.25	.3	.30	....
Justice	1.50	1.75	1.55	1.60	1.50	1.40	1.45	1.55
Kentuck	1.25	1.85	1.45	1.6	1.40	1.50	1.30	1.45
Lady Wash	....	.40	.35	....	.35	.40	....	....
Mono	.45	1.00	.60	.80	.60	.65	.60	.65
Mexican	3.05	4 15	3.05	3.25	3.10	3.40	3.15	3.40
Navajo	.54	.56	.60	.75	.20	.77	.60	.65
North Belle Isle	1.40	1.50	1.25	1.50	1.40	1.50	1.15	1.30
Nev. Queen	.75	.90	.90	....	.85	1 10	.75	.85
Occidental	1.45	1.85	1.65	1.85	1.60	1.75	1 40	1.60
Ophir	4.35	5.15	4.35	4.75	4.25	4.55	3.90	4.75
Overman	2.45	3.20	2.55	3.05	2.70	2.90	2.45	2.75
Potosi	7.62	9.25	7.62	8 50	7.25	8.00	7.50	8.25
Peerless	....	.25	.25	....	.25	....	.20	.25
Peer	....	.20	.20	.25	.30	....	.15	.20
Savage	3.80	4.90	3.90	4 30	4.20	4 85	....	....
S. B. & M	1.60	2.10	1.70	2 00	1.90	2 00	1.80	1.95
Sierra Nevada	3.00	4.30	3.20	3.45	3.25	3.55	1.70	1.75
Silver Hill	.35	.50	.35	.4.	.35	....	.35	....
Scorpion	....	.30	.25	....	.25	.30	.25	....
Union Con	2 60	3.80	2.70	3.00	2.75	3.10	2.60	3.05
Utah	.90	1 40	1.05	1.20	1.01	1.10	.90	1.10
Yellow Jacket	2.60	3.50	2 80	3.40	3.00	3.35	2.95	3.30

Sales at San Francisco Stock Exchange.

THURSDAY, July 24, 9:30 A.M.

100	Gould & Curry	.....2.70	
2 0	Hale & Nor	.....2.75	
14	Belcher	.....2.25@2.50	
100	Justice	.....1 40	
100	Belle Isle	.....1.25	
420	Mexican	.....3 25@3 30	
150	Best & Belcher	.....3.85	
50	North Belle Isle	.....1.30	
175	Bodie	.....1.15	
50	Occidental	.....1.35	
650	Bullion	.....3.80@3 90	
290	Ophir	.....4.70@4.75	
200	Caledonia	.....4c	
100	Overman	.....2.45@2 50	
250	Chollar	.....3.65	
700	Peer	.....15c	
100	Con. Cal. & Va	.....3.90	
200	Potosi	.....7.75	
360	Con. Imperial	.....35c	
300	Savage	.....3.80	
200	Con. Pacific	.....20c	
100	Seg. Belcher	.....1.70	
100	Crown Point	.....2.65	
600	Sierra Nevada	.....3.10@3 20	
150	Del Monte	.....1.70@1.75	
470	Union	.....2.8 @2.85	
100	Exchequer	.....95c	
400	West Comstock	.....35@40c	

Coal.

TO LOAD.	Per Ton.		Per Ton.
Australian	7 50 @ 7 75	Lehigh Lump	16 50@17 00
Liverpool St'm	8 00 @ 8 25	Cumberland bk	13 50@—
Scotch Splint	8 25 @8 37½	Egg, hard	15 00@—
Cardiff	8 50 @—		

SPOT FROM YARD.			
Wellington	$ 9 00	Seattle	0 50
Greta	8 50 @ 9 00	Coos Bay	6 00
Westminster Brymho	9 00	Cannel	12 00
Nanaimo	9 00	Egg, hard	16 00
Sydney	8 50 @ 9 00	Cumberland, in sacks	16 00
Gilman	6 50	do. bulk	15 00

CANADIAN ANTHRACITE COAL.			
Egg, ship side	$12 50	Stove, yard	$15 00
Egg, yard	15 00	Nut, yard	15 00

COKE.	
English, to load	$12 00@13 00
English, spot, in bulk	13 50@15 00

Meetings and Elections.

TUSCARORA M. CO., July 18. Directors—W. R. Townsend, J. F. Holling, Wm. M. Bunker, J. J. Scoville and F. E. Birge. W. R. Townsend was appointed president, J. F. Holling vice-president and J. J. Scoville secretary. The company has an indebtedness of $1466.99.

SAVAGE M. Co., July 18. Directors—H. M. Levy, president; A. K. P. Harmon, vice-president; E. B. Holmes, H. Zadig and Morris Hoeflich. E. B. Holmes continues as secretary and R. P. Keating superintendent. The financial statement, submitted by Secretary Holmes, showed the bullion receipts during the year to have been $232 854 77, and the present indebtedness of the company to be $14,416.89.

YELLOW JACKET M. Co., July 21. Trustees—W. E. Sharon, G. A. Morgan, P. Ennis, G. D. Edwards and J. W. Eckley. J. W. Eckley, president; G. D. Edwards, vice-president; R. F. Morrow, treasurer; W. H. Blauvat, secretary; James Newlands, transfer secretary in San Francisco, and W. E. Sharon superintendent.

Total Gold Product of California.

From the best authorities the following statement of the gold product of California is compiled:

Year.	Amount	Year.	Amount.
1848	$245,301	1870	17,458,133
1849	10,151,360	1871	17,477 885
1850	41 273,106	1872	15,482,194
1851	75,038,232	1873	15,019,210
1852	81,294,700	1874	17 264,886
1853	67,613 487	1875	16,876,009
1854	69,433,931	1876	15,610 723
1855	55,485,305	1877	16,501,268
1856	57,509,411	1878	18 839 141
1857	43,628,172	1879	19,626,654
1858	46 591,140	1880	20,030 791
1850	45,846,599	1881	19,223,195
1860	44,095,163	1882	17,146,416
1861	41,884 995	18 3	17,257 873
1862	38,854,068	1884	13,600 000
1863	23,501,736	1885	11,750,490
1804	24 071,423	1886	14,725,0 00
1805	17 930,853	1887	13,588,614
1800	17,123,867	1888	9,160,087
1867	18 205 452	1889	9,390,044
1868	17,555 867		
1869	18,229,044	Total	$1,172,551,396

This statement is for gold alone, the value of silver, lead, copper, quicksilver and other mineral products not being considered in the table. Notwithstanding the decrease of late, largely due to the suppression of hydraulic mining, California still holds first position among all the States as a producer of gold.

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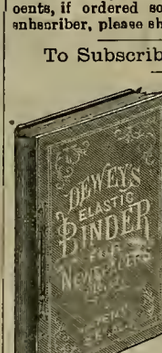

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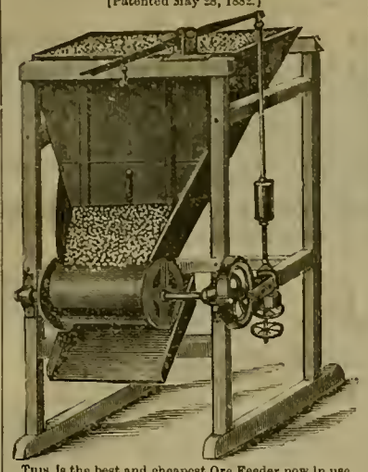

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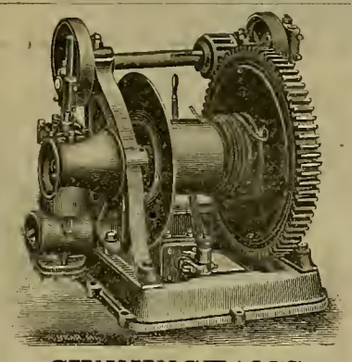

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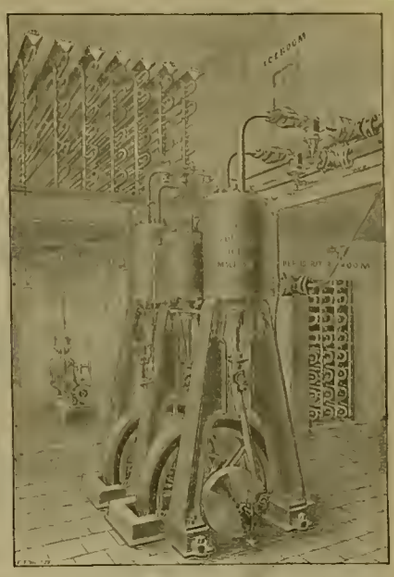

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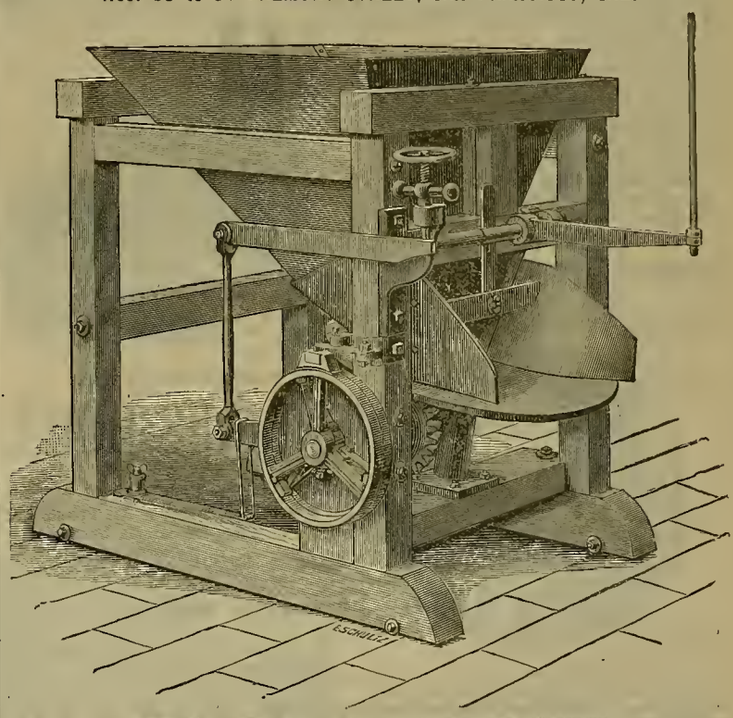

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OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, June 30, 1890. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 33) of One Dollar ($1.00) per share was declared, payable THURSDAY, July 10, 1890, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer Books close July 5, 1890, at 3 o'clock P. M.
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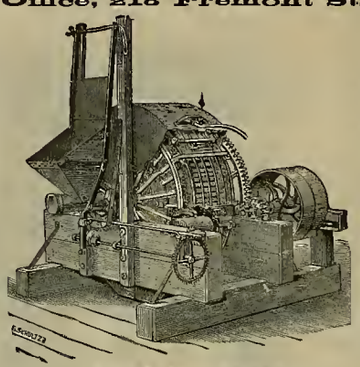

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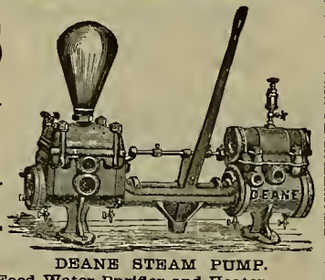

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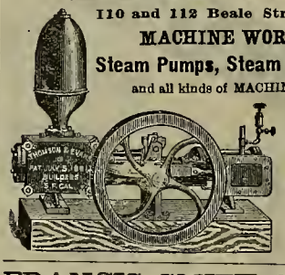

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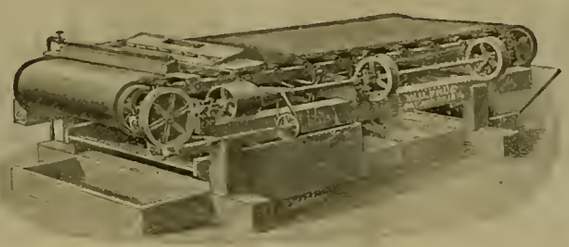

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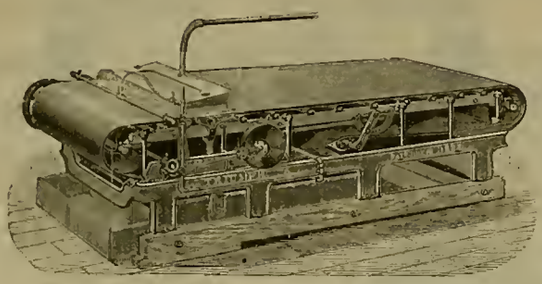

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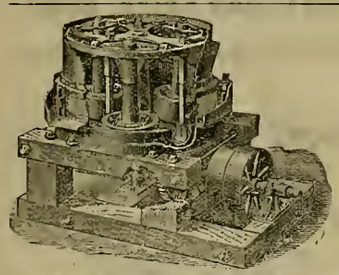

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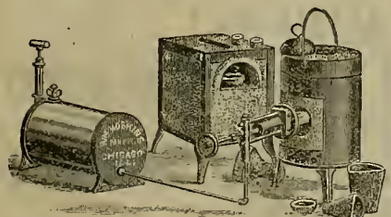

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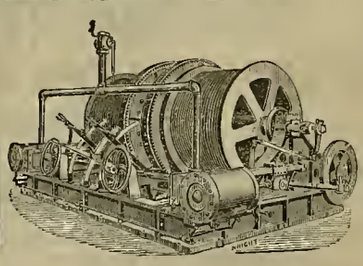

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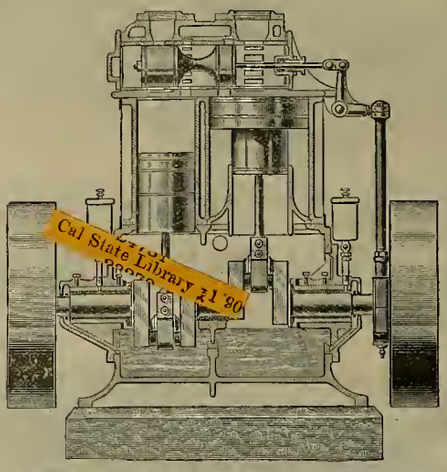

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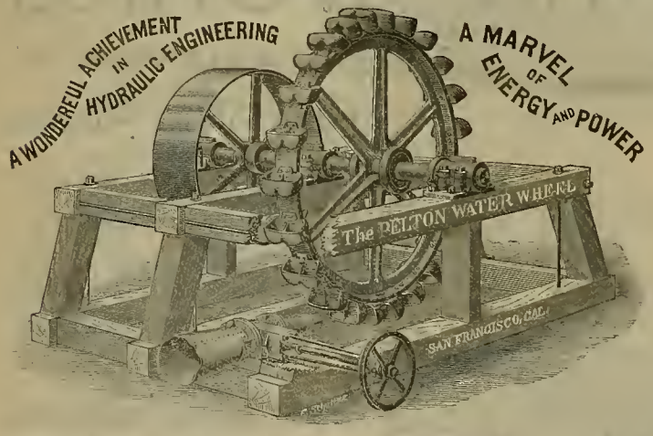
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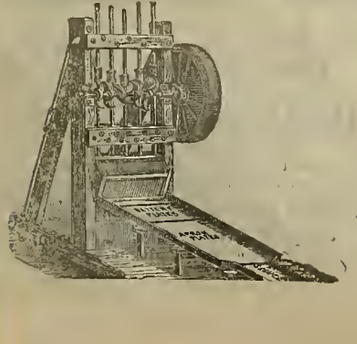

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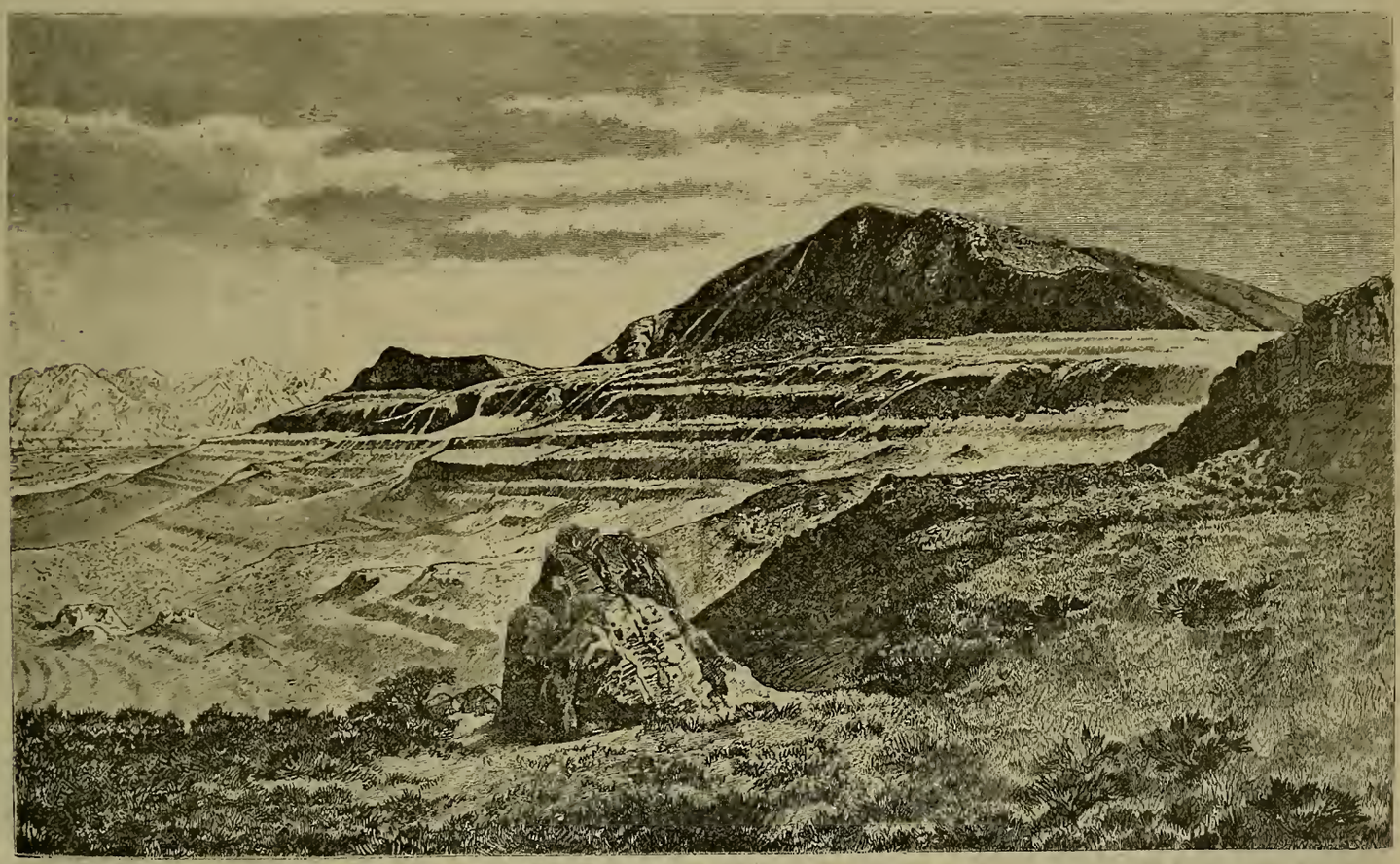
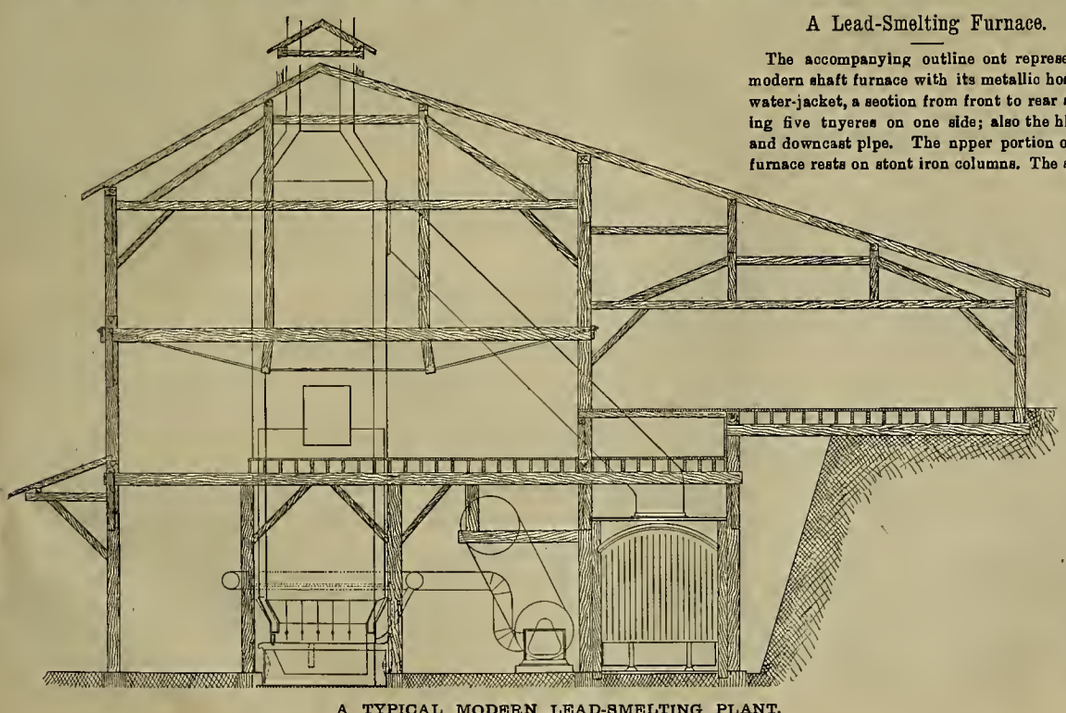


SEA CLIFFS AND TERRACES CAUSED BY THE WAVES OF LAKE BONNEVILLE, ON THE NORTH END OF THE OQUIRRH RANGE, UTAH.—See page 74.

A Lead-Smelting Furnace.

The accompanying outline ont represents a modern shaft furnace with its metallic hosh, or water-jacket, a seotion from front to rear showing five tnyeres on one side; also the hlower and downcast plpe. The npper portion of the furnace rests on stont iron columns. The skeleton hnilding surrounding it is also shown. The ont is one from the report of the State Mineralogist. This fnrnace has a hearth area of three feet six hy eight feet six, and 11 tnyeres, five on each of the long sides and one in the hack wall. The nozzles of the tnyeres are four lnches in diameter. The hight of the fnrnace from the oenter of the tnyeres to the feed-door is 13 feet; depth of the cnoihle helow the edge of the hearth-plate, 26 inches. In this drawing, the hlower (whioh is a Baker, size seven and one-half) is represented immediately in the rear of the fnrnace. It is hetter, however, to plsce the hlower or hlowers, as many as may he required, in the engine-room, not in the fnrnace-room proper. When the hlower is so plnced, it is desirahle that the snpply of air for the hlast shonld he drawn throngh a hrick oondnit oonnecting with the outer air, hecanse if such he not done, the revolutions of the hlower cause a disagreeahle vihration of air in the engine-room, and mnch olattering of windows and other light materials.

If there he more than one fnrnace, it is preferahle to connect as many hlowers as may he reqnired with a general supply-pipe, and draw from it the amonnt of air reqnired for eaoh fnrnace. The main snpply-pipe should have an end valve and safety valves at the proper distanoes. A No. 7½ Baker hlower reqnires 35-horse power to drive it. It will he observed from this drawing that the fine descends to the dnst-chambers from a point in the stack above the oharging doors.



A TYPICAL MODERN LEAD-SMELTING PLANT.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Gold Belt of Northern California.

Ancient River Channels and Gravel Deposits.

NUMBER VIII.

[Written for the MINING AND SCIENTIFIC PRESS by JAMES F. TALBOTT, Blue Canyon, Placer Co.]

There was no trace of blue gravel in our claim at Indiana Hill in the outlet channel, but on going back into the hill several hundred feet it set in, first in small patches of fine gravel, then a thin stratum of the same, a few inches thick, covering the bedrock and filling up the crevices. This gradually increases in thickness as you go back, till the whole basin is filled to a depth of from 50 to 100 feet, the bottom generally being the hardest kind of blue cement, probably formed by a combination of minerals derived from the serpentine. The top is very compact, but not cemented; it has the same peculiar blue color, but appears to be wanting in the mineral substances that form the hard cement of the bottom. As the Dutch Flat portion is approached, the bowlders and coarser material take the place of the finer gravel. When the Polar Star claim is reached, we find a mass of rough angular *serpentine* bowlders intermixed with gravel-quartz bowlders and all kinds of material found in this section of country, the whole mass being tinged with that peculiar blue.

Deposits Above the Serpentine.

In the channels and gravel deposits above the serpentine, at Sunny South, Damascus, Red Point, on the Middle Fork Divide, and Shady Run, Lost Camp, Omega and Diamond Creek on the North Fork Divide (Michigan Bluff on the former and Lowell Hill on the latter, right on the eastern border, might be included), none of this peculiar blue cemented gravel has ever been found. It must be obvious from these facts that the world-renowned "Great Blue Lead" originates in and from the great Serpentine belt formation. The conditions observed here in regard to this "blue lead" will apply to any other locality all the same. As the general character of all deposits is about the same, differing only in detail from some local influences. The general belief in the universal richness of "the blue lead" has no more foundation in fact than it is a distinct deposit. Many an old miner at this late day thinks if he can "strike blue gravel and the bedrock pitching," he has a "bonanza." We have seen hundreds of tons of this blue gravel with scarcely a color of gold in it. Where, by the action of water, the gold is concentrated in the blue gravel, it is rich, and not otherwise, just the same as any other colored gravel; hence the conclusion is that the existence of a distinct deposit, known as the "big blue lead" is a myth, and the idea of its universal richness a great mistake.

With reference to the theory here advanced, the main ideas to be kept in view are, that there is but one ancient channel and tributaries within a certain defined locality, and, like the present rivers, is independent and separate from any other. Within those bounds all of the gold found in the present rivers, canyons, modern channel and gravel deposits has come directly from the ancient channel in that certain locality, except that which during the floods and flows was broken from quartz ledges and ground to fine dust, and that which was melted into nuggets by the molten lava, as a considerable amount of it has been, we believe. The main flow of lava through that locality indicates approximately the course of the ancient channel.

First Lava Flow.

The first flow of lava into the ancient river system ended the old and commenced the new. The great changes first observed in the order of the new, are the cutting out of the modern channels and forming the gravel deposits from them in the early stages, of which they are supposed to be in a position midway between the ancient and the present rivers. Subsequently the displaced waters from the ancient rivers have cut the present ones down from a level with the gravel deposits to their present beds, several hundred feet below. The process of filling up and cutting out here commenced and continued till the change was complete, a description of which has heretofore been given. In the practical application of this theory, it is found to be in perfect harmony with all of the conditions and natural methods. The most important consideration in regard to any channel or gravel deposit is the conditions for pay.

With reference to the ancient channels, which contained all of the original deposits of gold, there can be no doubt about the pay, as is shown wherever they have been penetrated.

Modern Channels and Deposits.

There are many modern channels and gravel deposits that are rich and have big pay in them, and many others with comparatively nothing of value in them. It is obvious if all of the conditions were the same, all deposits would be alike. In all of those rich channels and deposits that have been developed the conditions are apparently well defined, and in those only developed on the surface they are supposed to be the same, and the natural methods of formation and results may be illustrated by the process in a hydraulic mine. First, a cut or opening is made through the outside rim back into the pay deposit; a proper grade is given to retain the gold; a good dump or outlet is important to prevent the tailings from blocking up the work, and with all of these, a long run is essential for a big clean-up. It is observed here that any break or outlet from the ancient channels subsequent to the period when they commenced filling up, is termed a modern channel. A break or opening deep enough to let out a portion of the gold from the original deposit, the right grade to retain it, a free outlet and a period of long duration are the favorable conditions for forming rich modern channels and deposits from them. In some localities these channels may run directly from their source to the outlet into the present rivers, which is probably the case at Michigan Bluff, Bath and other points on the Forest Hill ridge. In other localities a number of those breaks may unite in a common channel and form an extensive deposit, as at Dutch Flat and Gold Run. The extensive deposit at Todd's valley is probably of this character. These latter are more in the form of basins than channels. That the most of those channels and deposits were formed under the favorable conditions, on the southern slope of the Forest Hill ridge, it is only necessary to mention the fact that from many single claims on them, of comparatively small area, from $50,000 to $1,000,000 in gold has been taken out. On the opposite side of the ridge are the deposits at Yankee Jim's and Brushy canyon from breaks to the west. There are no breaks through the high rim on the north towards Shirt-tail canyon, consequently there are no deposits on that side. The deposits at Yankee Jim's and Brushy canyon, but a short distance apart, present a remarkable contrast in regard to richness, and show the importance of an unobstructed outlet. In the former no richer deposit of this character has been found in this portion of the State. Two of the favorable conditions are recognized here, outlet and a long run, both of which appear to be wanting in the latter, which is of little value, the fine gold being intermixed all through too much gravel. With a good outlet and a long run the gold would have been concentrated here the same as at Yankee Jim's. The conditions observed in the Brushy canyon deposit might be compared to that in a hydraulic mine where the water is turned off just after a big cave comes down.

The development made by the Mayflower Company, in this deposit, shows there is 400 feet in depth of light material and top gravel overlying the ancient pay channel here. We can account for this only in one way; that is, the floods have carried the lighter material from the higher grades above; there being no outlet, it has filled in here till the floods were turned off by a lava flow.

The Ridges.

The Forest Hill ridge is so very wide that it is possible parallel channels may run a short distance in some localities in the lower portion. The Iowa Hill ridge is quite narrow in the upper portion. The source of this channel has heretofore been described. Two of the favorable conditions are recognized here, outlet and a period of long duration in the lower portion, especially in the deposits and canyons heading in them. It is a well known fact to practical miners, that a big rush in the nature of a slide will carry gold with the gravel and debris a long distance and leave it high above the bedrock, if no water follows to settle and concentrate it; but if a big head of water follows, the heavy coarse gold settles to the bottom first and is concentrated in crevices and spots favorable for retaining it, while the finer gold is carried on below and deposited along, where the conditions are favorable, to the outlet, where it is largely concentrated on the rim by the lighter material being carried away.

We find something of a parallel to this in this channel and its deposits. At Iowa Hill, King's and Wisconsin Hills and Grizzly Flat, the outlets, very rich deposits of fine gold were found on the outside rim; but a short distance above, very rich spots and crevices were found at the head of Indian and Grizzly Canyons, containing principally coarse gold. A few miles up the ridge to the east, is Sucker Flat, where some scattering rich spots of big, coarse gold have been found. Some nuggets worth from $100 to $1000 have been taken out here.

Although there is an extensive body of gravel in the ridge all the way up to Damascus, we have never heard of any rich pay being found in this channel above Sucker Flat. These conditions may be accounted for from the source being narrow and the upper portion of the channel having a steep grade, whereby the floods during the gold-depositing period have swept the greater portion of the gold down into the deposits below. And when the channel commenced filling, the source was blocked up and this body of top gravel from above has filled the upper portion of the channel. Probably the same conditions exist in many of the other modern channels. The upper portion of the channel in the Nevada ridge presents somewhat similar characteristics.

"Modern deposits," as used here, may be termed secondary, to distinguish them from the original deposits in the ancient rivers, and the more recent ones in the present rivers and canyons. Their connection with the latter is apparent and can be more readily demonstrated than with the former. Nevertheless they form the connecting link between the two.

The connection between the secondary deposits and the recent ones in the rivers and canyons can be practically illustrated on the Middle Fork and numerous other places in the gold belt.

Rich Pay in Early Days.

In early days of river mining, some of the richest deposits in the State were found on the Middle Fork. In the summer of 1851 a number of companies united and constructed a continuous flume for several miles on the river, each company having a defined boundary to their claim corresponding with their section of flume. Old-timers who worked on the river that season well remember how some companies took out large fortunes from their claims, while others above and below them "busted up," not taking out enough to pay the heavy expenses incident to such operations in those days, when labor and everything was high.

The results here seemed to establish the prevailing idea that success in mining depended altogether on luck—a primitive idea, ignored by the progressive miner of the period. It was subsequently ascertained that those rich deposits on the bars and in the river were in the immediate vicinity of where a portion of the gold from some rich secondary deposit on the hill had followed the erosion of the present river down to its present level, or where some rich canyon emptied that had cut back into the deposits. It was observed also that those points are mainly on the north side of the river and from the Forest Hill ridge, and that the pay diminishes on going down stream from the richest points.

Immediately below Indiana Hill were rich deposits in the river and on bars of the North Fork, which diminish in richness gradually down to opposite Iowa Hill, where some very rich deposits and bars were found. From a short distance below this last point the richness dwindles down till it becomes very thin.

Devil's canyon was very rich for a distance below from where it cut down from Georgia Hill and connecting deposits about Yankee Jim's.

(To be Continued)

The Oathill Quicksilver Mine.

[From Our Traveling Correspondent.]

This mine is situated eight miles southeast from Middletown, Lake county, California, in some of the finest scenery in America. It is the second in importance and product among quicksilver mines in the United States. The present working force is about 200 men, and the output varies from 200 to 400 flasks per month.

The Shaft

Is a double compartment, and is 900 feet deep, with engines and appliances reminding one of the machinery in Virginia City. They elevate, besides the water, about 60 tons of ore and 40 tons of waste rock daily. The location is upon a steep hillside, and they easily provide for an immense quantity of waste, which indicates many a thousand feet of underground tunnels.

The Furnace.

This was built in 1882, and is an immense affair of brick burned in the locality. The condensers are even more complicated. First comes one of brick, another of iron and a third of brick. Even then the fumes are not allowed to escape, but a spray in the chimney condenses a small percentage even there. It was amusing to notice how carefully the exhaust steam was utilized. After winding a devious way and performing many services, it finally escapes where there is little more to be seen of it than of a man's breath in a cold day.

A New Device for Drying Ore.

As the ore passes from the rock breaker down a sloping bank to the drying pans, it passes through a chamber surrounding a coil of steam pipes. Three inches of rock are above and three below the pipes. This is kept full all the time, and as the ore is shoveled out, it is pretty well dried before it is shoveled upon the regular pans.

A Home Market.

Although the people of Lake county think they are suffering badly from want of railroad communication, they are unusually fortunate in their home market from the mines and springs.

This mine alone has 200 workmen and their families, 30 horses and 18 work cattle to feed. It also requires a large amount of wood and of timber for shafts, tunnels and buildings. It has its own blacksmith and wood-working shops, its butcher shop and store. They consume between 300 and 400 beeves and nearly 2000 hogs per annum. Of course, they use grain, fruit and vegetables in proportion. Now, on the majority of these things, the freight across the mountains operates as a protective tariff. This is only one of the mines. Extensive plants have long been at work at the Bradford and Great Western mines, as well as at Sulphur Bank. Then they are reporting at the Bullion a large ore body that assays $120 per ton.

Mr. B. M. Newcomb, the gentlemanly superintendent at Oathill, has reason to be proud of his home as well as his mine. It is in as sightly a place as an eagle might choose and yet adorned with beautiful trees, garden and lawn, and furnished with the elegance of a city home. A vine maple near the door, that would easily make four cords of wood, is a wonder in its way. They have a school of 23 children up there among the clouds, and a very flourishing Sunday school in which Mrs. Newcomb and her sister take special interest. They had a concert yesterday, and to accommodate their friends had built a beautiful house or bower of evergreens to hold 150 guests. The waterworks lead everywhere and provide an abundant supply of such water as can only be found in the mountains. It is under a 200-pound pressure, that makes fires very insignificant affairs if only they are seen in time. The saw mill is doing very nice work and enough of it to require nine yokes of cattle to supply it with logs. This is one of the mines whose surroundings contain evidences of thrift and attractions of home.

F. S. C.

In Sierra County.

EDITORS PRESS:—Sierra City appears to be getting on very well, considering the very hard winter it has passed through, though it looks a little desolate in the vicinity of the snowslides. There were five slides last winter in different parts of the town. The Sierra Buttes has a large quartz-mill here, but from all appearances it looks as if they were doing very little. I called at the Chips quartz mine, about two miles northeast of Sierra City. They have commenced operations in earnest and employ 25 men fitting up the mill and mine. They use a Kirk and Firth air-compressor and Burleigh and National drills and will soon add another drill. They expect to start the mill in about a month. L. Lock is superintendent of this mine, which is owned by San Francisco parties.

A short distance above this mine, on the Sierra Valley stage road, is the plant of the Sunderhaus Consolidated, formerly the Mountain mine. R. B. Harper is superintendent. They are pushing ahead the work on the big mill for which Robt. Forbes of Downieville is furnishing castings and machinery. The foundry and blacksmith shop are about completed. There is quite an army of carpenters at work framing the mill. The mine is about 6000 feet distant up the mountain and will be connected with the mill by bucket tramway. They expect to have the mill at work by October 1st.

The famous Young America mine, up above Upper Sardine lake, is doing well. They have about 145 men on the pay-roll. They are pushing the No. 4 tunnel ahead which will tap the ledge on a level with the ore-house. There is plenty of good rock in sight for a number of years. P. Dedesheimer is the manager of this property.

J. M. S.

Mining Outlook of Nevada.

The mining outlook of Central and Eastern Nevada is daily improving. Not in the history of the State, excepting in its earliest days, before silver was demonetized, has the outlook for the mines been so healthy as at present, and scarcely a day passes that we do not see in some of our exchanges reports of new strikes and new developments. In Pioche the outlook is very favorable. In Eureka they are extracting and shipping a large quantity of low-grade ore, yielding a profit of about $10 per ton. Tuscarora is prosperous, the mines all doing well. In Humboldt county, from the Paradise mines they are shipping more concentrations, and the mines producing more good ore than they have for years. A rich strike is reported in Winnemucca mountain. At the old camp Unionville, the Arizona mine that produced bullion and shipping ore to the amount of $7,600,000, after lying idle for ten years, was started up again by Sy Wheeler of Booth & Co., Sacramento, and is showing abundance of first-grade ore. The Hope mine or Lucky Dog, as it is known, owned by a Michigan company, have cut within the last ten days five bodies of very rich ore, and so it is all over Middle and Eastern Nevada, and we believe the day is not far distant when Austin will, as in days past, be extracting large quantities of high-grade ore and be making large shipments of bullion. We all know that no mining camp in the State has produced as rich ore as that taken from Lander hill, and it is folly to think there is a person living in Austin in this the nineteenth century, so demented as to believe that the ore bodies have all been worked out, and if the mining population will only have confidence, the town of Austin will, in the near future, put on a new dress and come out with flying colors as of old.—*Reese River Reveille.*

THE CANDELARIA MINES.—The famous Candelaria group of mines in Zacatecas, Mexico, comprise 44 claims and 14 mines. The principal mine of the group is the Candelaria, which was, when the present owners took hold of it in 1873, nothing more than a mere prospect hole called La Mala Noche, a name which was at once changed for that of Candelaria. The first records of its operation are dated June, 1873. All the known veins of the district either border on or pass right through the Candelaria property, and all of them, as well as their off-shoots or spurs, are impregnated with gold and green silver. These metals are especially abundant in the Candelaria vein, in which most work has been done, and which is really remarkable for the quantity of native silver and silver sulphide which it contains. The profits yielded by this property have been remarkable; indeed there are few cases in the history of mining which can bear comparison with the record of the Candelaria mine, and few properties that can boast like it of having given (up to December 31st, 1880) a return of $1,184,959 on an initial investment of $5640.

San Bernardino County.

Its Mineral and Other Resources.

NUMBER IV.

[Written for the Press by JAMES H. CRESMAN.]

Mountain Ranges

After leaving the main Sierra Nevada range at Tehachepi the San Gabriel appears, a high mountain range extending southerly to Los Angeles and Pasadena. Its course is easterly and westerly. Its dominant peak is known as the San Antonio, rising to a hight of 9630 feet above the level of the sea. The San Bernardino range proper, commences where the San Gabriel ends. From this point its strike is south 34 east, and terminating at a point in the vicinity of and opposite Yuma, on the Colorado river. San Bernardino mountains contain several prominent and noted peaks. San Bernardino peak forms the initial point of the U. S. land surveys, at an elevation several hundred feet lower than its summit. San Jacinto peak, situated south of San Gorgonio pass, rises to a hight of 10,920 feet, forming a prominent land-mark, visible from almost any point in the desert region.

Desert Mountains.

That portion of San Bernardino county lying north of the San Bernardino and the San Gabriel ranges of mountains is known as the desert region, which is dotted with short ranges, low buttes and isolated peaks. That mountain known as the Providence range is the most important and of the greatest longitudinal extent. This with Kingston mountain and the Yellow Pine, constitute the principal ranges of this region. Combined, the mountain portion of the desert covers but 5825 square miles of the entire area of 17,476 square miles of mountainous country.

Geology.

The core or axis of the San Bernardino range of mountains is granitic, varying in character and composition from syenite to gneiss and mica schists, with quartzite dykes and lime belts of great width, strength and longitudinal extent. Some of the rocky structure has been highly metamorphosed; hornblendic slates and magnesian rocks also occur. In many places on the northerly slope of the San Bernardino range of mountains unaltered sandstones are seen in immense quantities, particularly in the vicinity of Holcomb valley, in the Bear Creek Hawk, which is a spur of the main range.

On the southerly flank of this range bodies of carbonate are seen dipping at varying angles. On the northerly flank of the San Gabriel and San Bernardino ranges an important belt of limestone occurs of great width and extent. This belt is traceable from San Antonio peak northeasterly through Holcomb valley to Twenty-nine Palms; thence on its line of strike appearing and disappearing as far as the Colorado river, and possibly extending into Arizona. Its width varies from four to ten miles with occasional spots and dykes of syenitic rocks and micaceous schist, trap, porphyries and strata of magnesian and talcose slates. This belt of limestone is not uniform in character. It often changes from a dark-blue mountain limestone to a carbonate of a dazzling whiteness (marble) varying in texture, color and crystalization from that of a yellowish dolomitic magnesian limestone, but still marble. On either the northerly or southerly border of the belt near the contact of granite and mica schist it is invariably metalliferous to a greater or lesser extent, and quite an important figure in the metallic domain of this county. The border metals are, however, as a rule, dissimilar in character. The ores of lead and silver occur at and near the southerly contact, while on the northerly line of demarcation the veins carry gold in paying quantities. The Black Hawk mines are a notable instance of the latter feature. The prospector can here find a virgin field in which to show his skill and test his luck by following the line of contact denoted. This metalliferous belt, both east and west of Cushenbury has been but little prospected. The indefatigable and old-time prospector, O. G. Leach, is the only one that I have ever talked with that seemed to understand the situation.

Silver Mountain

Is an isolated peak or lone butte of insignificant proportion, but of great commercial value as a producer of marble and lime. It lies three-quarters of a mile southwest of the town of Colton. Its dimensions are three-quarters of a mile in length from north to south by half a mile in width, and it reaches an elevation of 700 feet above the level of the sea. We cross the San Bernardino range or Cajon Pass and into

The Desert Region.

The Ord mountain range, inclusive of the Lava Bed range, which is a southeasterly prolongation, has its greatest elevation at 6500 feet in Eagle Peak. It is situated in the Mojave desert, about 50 miles northerly from San Bernardino, and is about 30 miles in length by from four to six miles in width, with a northwesterly and southeasterly strike. The Lava Bed mountain is a prolongation of this range in a southeasterly direction, only divided by a low pass. On its northerly flank the remains of an extinct crater (volcanic rent) are seen with its cup-shape depressions from which at no remote period immense quantities of molten lava were ejected. This mountain range attains its greatest elevation at Eagle Peak, a prominent landmark and feature in the landscape visible from almost any elevated point in the desert region.

This section for many miles, in every direction from Ord mountain, contains almost every known formation, igneous rocks predominating. In the northwesterly extremity of Ord mountain, a massive quartzite dyke appears coursing with the formation and dipping 70 degrees northerly from the vertical. The axis of the range is granite. On either side of the dyke referred to, we found metalliferous veins of quartz of great strength and persistence carrying metallic gold and the ores of copper of unusual richness. The mountain at this point is composed of metamorphic rock, porphyries, granites, magnesian and talcose slates. Eruptive dykes of trap with other varieties of igneous rocks evidence subterranean heat, as previously stated.

The Lava Bed Range

Is a southeasterly prolongation of the Ord. Its course is north 22 degrees east; its dominant peak (Clark's) rises to an elevation of 4500 feet and is located 26 miles easterly from Daggett (in an air line). Its axis is granitic, but so much changed and metamorphosed from the effects of subterranean heat, the evolution of powerful gases and thermal water that it is scarcely recognizable, it being in the immediate vicinity of several prominent volcanic vents which are situated from 4 to 5 miles distant in an easterly direction and has felt their effects. This mountain is traversed by fissures whose strike is 70 degrees west of north. These fissures in the earth's crust have been filled with quartz and a brecciated mass of broken angular fragments of many varieties of rocks which have been ejected by dynamic forces from subterranean depths.

A noticeable feature, however, is that the edges and angles of these fragmentary rocks are sharp and charged, as a rule, with a sufficient quantity of the oxides of iron and manganese (which is disseminated through the mass) to give it a brown black or reddish tinge. Wherever quartz fills the fissure it is invariably found rich, carrying the ores of gold, silver and lead. These vein dykes rise boldly from 10 to 50 feet in hight and form marked features in the landscape which are visible for many miles as their black lines cut the lighter colored formation of the mountain's slope. To all appearances these fissures were at a period anterior to the comparatively recent volcanic disturbance, filled with quartz but subsequently reopened, and their integrity as quartz veins destroyed and shattered by the ejection of a broken mass of the rocky structure through the powerful effects of volcanic action.

Victor Mountain

Is two miles long by one in width, with a northerly and southerly trend. It is 700 feet high, and composed of a close-grained, homogeneous granite, forming the two valuable granite quarries that are being worked in the vicinity of the town of Victor. On the northerly end an extensive lime belt occurs of one mile in width, with an easterly strike, and a longitudinal extent of 12 miles, in which there are veins of quartz carrying the ores of copper, gold, silver and lead. To all appearances, Victor mountain at one time formed the northerly rim of either a river channel, prolongation of the Gulf of California or an extensive lake similar to that of Salt Lake in Utah. Either or all of these theories are tenable and possible. The geological structure of the country goes to prove that many changes have taken place in the topographical features of that portion of the North American continent that lies West of the Rockies. Upheavals and depressions of the earth's crust have repeatedly taken place.

Leaving Cajon Pass, at an elevation of 4676 feet, passing northerly through Hesperia, with her forests of cactus (yucca), we descend into the valley, following nearly on the line of the Mojave river. Victor mountain apparently forms a barrier to the further progress of both train and river, there being no visible outlet. But as we approach the mountain, a narrow gorge is seen barely wide enough to admit our passage, its walls rising sharply to a hight of several hundred feet, through which both river and train enter and pass. We now enter the Mojave desert proper, with its broad acres of barren, sandy, alkaline flats dotted with short ranges and isolated peaks raising their heads above the surrounding plains. A photograph from some elevated point, as for instance from a balloon at a considerable hight, would show a bird's-eye view of what would appear to be an immense sea dotted with numerous islands.

The Oro Grande Mountain,

Whose greatest elevation is 3925 feet, forms the easterly boundary of the Mojave river. It is 10 miles long by 5 in width at its widest point, coursing northerly and southerly. Its stratification is northeast and southwest and largely composed of volcanic eruptive material, porphyry, volcanic debris and a cemented brecciated mass of angular fragments of rock evidently ejected, through which courses dykes of trap porphyry and veins of metalliferous quartz, carrying the ores of gold, silver, lead and copper. These fissures undoubtedly occurred at a period subsequent to the formation of the mountain. On the easterly flank and in the vicinity of the river, a broad belt of nearly pure blue limestone occurs which is extensively used for manufacturing lime. Several kilns are in constant operation in the vicinity of a town bearing the name of the mountain which is situated on the bank of the Mojava river.

Calico Mountain

Is situated 80 miles northerly from San Bernardino. Its highest peak is 2975 feet above the level of the sea. It is 12 miles in length by from 3 to 4 in width. Its strike is north 40 west. The nearest town and railroad connection is seven miles southerly at Daggett. This mountain is known as the Comstock of the desert, from its large output of silver in the past and large reserve in store in the future, rendering it to the capitalistic miner an objective point of great interest for its mineral wealth. To the student and scientist it is an unsealed book, but one of great interest and no less instructive. Its pages have been thrown open and lay exposed to the investigation of the diligent observer and scientific inquirer. Its geological features are simple and easily read. The mountain *per se* consists of an eruptive mass of liparite (porphyritic rhyolite) colored and stained in various hues by the oxides of iron in combination with other minerals. These parti-colored rocks and earth were the origin of its name. There have evidently been a series of eruptions (certainly not less than three) following each other at long intervals—as man understands time—but in very brief periods and in rapid succession, geologically speaking. The first ejected from its deep-seated center the immense beds of tufaceous material that is seen on the surface stained with the various colors of the rainbow decidedly pronounced—from a dazzling white to a jet black; from a cerulean blue to a rosy red, changing to a golden yellow. This strange combination of colors was caused, doubtless, by powerful gases and thermal water that were evolved from cracks and fissures in the earth's crust acting on the metallic contents of the mass. These were the resultant effects of the first volcanic eruption.

Volcanic Periods.

The second of note was not less violent or less destructive. It deposited the enormous masses of brecciated and cemented material, forming a cryolitic paste that covers in places to a considerable depth a large portion of this isolated mountain. Calico mountain was evidently the center of disturbance. Lateral volcanic cones of lesser importance are seen at varying distances of from four to eight miles in the vicinity. This class of volcanoes are known as water volcanoes, ejecting water, mud and broken fragments of rock instead of fire and molten lava. Four miles in a southerly direction in the vicinity of the town of Daggett, a massive outburst has taken place. An oblong hill 250 feet in hight and 1000 feet in length is entirely formed of this volcanic material. At its base we find the Waterloo mill of 60 stamps. At a date contemporaneous with and anterior to this volcanic outburst, that whole country now known as the desert was evidently covered by an inland sea of saline water of considerable depth—in all probability an arm of the Gulf of California. This is evidenced by the saline and alkaline deposits of borax, soda, salt, etc., that are found in each immense quantities in the desert region. A lapse of time occurred and disintegration of the newly formed pasty and rocky structure rapidly ensued, and our newly formed mountain lost its integrity.

Its detritus, through gravity, atmospheric influences and the erosive action of water, sought lower levels. The land encroached on the sea and lakes were formed which, together with the detritus from the surrounding mountains, assisted by the powerful action of the sun evaporated the waters and soon filled the lake beds. The desert became a barren, desolate waste of sand. It must be understood that it was not Calico mountain alone and its vicinity that felt the effect of these forces, but all that territory that lies west of the Colorado river and north of the San Bernardino range of mountains. The zone, belt or line of disturbance took an easterly and westerly course and extended northerly, penetrating the State of Nevada for many miles.

At a Later Epoch

The "fire fiend" again came to the front; he had only been sleeping; his fires had not been extinguished; his strength was renewed and with a fresh accumulation of carbonaceous material he fired up his furnace and turned on steam and Calico mountain once more was in active operation, belching forth torrents and oceans of water with mountains of mud and rock. This powerful and continued blast had its effect. The rocky structure was in a state of fluidity. The furnace was tapped and other vents thrown open from which poured forth a molten mass.

The whole country was in a blaze of fire. Semi fluid lava in immense quantities on descending grades followed low depressions and beds of streams, filling the bede of the few remaining lakes. It was a contest between fire and water, and fire obtained the ascendancy. The east was made and the face of mother earth was covered with a sheet of scoria and lava. The rocky structure in every direction was in a plastic and semi-molten state, sedimentary beds and stratified rocks are seen folded and crumpled into every conceivable shape without a break or flaw.

The westerly flank of Wall St. canyon of the Calico mountain presents a marked illustration of the powerful forces then at work.

Evidently, at a still later period, after a cycle of rest, the fires were again rekindled and again burst forth. At this period the ejected rocky mass was largely composed of felsite, adding another variety of volcanic debris to the already accumulated mass of eruptive matter.

This, apparently, was the third and last attempt of the fire-fiend. We trust that the effects of his last efforts may have sent him to that bourne from whence "no traveler return" and that he may have been cremated in the furnace of his own construction. If so, "peace to his ashes."

(*To be Continued.*)

A Grand Redwood Reservation.

Our readers will be pleased to learn of the progress of Col. J. B. Armstrong's plan to donate a grand area of redwood forest in Sonoma county to the people of California as a perpetual reservation. Col. Armstrong has been a devoted lover of nature always and an earnest advocate of rural improvement which aims to "hold the mirror up to nature," and thus to do away as far as possible with the aspects of the cultivated country, which are almost a desecration of natural beauty. This spirit, of course, manifests itself in many ways, and one feature of its work lies in the effort to reserve certain representative areas of nature's grand work from the ax of the lumberman or settler. This is sometimes accomplished by the Government, sometimes by individual grant, and in some respects at least, the latter method is better, because the grantor being of necessity a nature lover can so place his gift that it shall be beyond the control of those with mercenary motives or those who have no love nor taste for such matters. Government grants or property granted to public use under Government control are very apt to suffer from mismanagement or sacrifice.

Col. Armstrong having prospered in this State of his adoption, now proposes to make a grand gift to the people of California and to place it in such hands that it shall always remain true to nature and true to its beneficent mission. We find in the Santa Rosa *Democrat* an outline of Col. Armstrong's plan, which may not be accurate in all particulars, but it gives outlines of the plan:

"Col. J. B. Armstrong proposes a reservation of a park of 600 acres near the end of the Guerneville branch of the S. F. & N. P. railway, in Big Bottom. Four hundred acres of it are covered with the natural virgin growth of redwood, laurel and other sorts of timber, some of the trees of great size and beauty, from five to 15 feet in diameter, and exceeding 300 feet in hight. It is the last large tract of redwoods on Russian river that is a fair specimen of the great forest once covering its banks in a state of nature.

We understand that it is to be conveyed to trustees, in perpetuity, for the people, under few restrictions, together with an endowment sufficient for the annual income to improve the grounds with drives, ornamental buildings, gateways, porter's lodge, etc. Two hundred acres, being improved with orchards, buildings and the like, are to be made productive so as to yield an annual income toward developing the park, and will afford a suitable site for growing flowers and plants under glass for planting along roadsides and filling vacant places under the direction of a landscape gardener, as time rolls on. For it is not for a day, but for all time. Fifty years hence, when these forests are a memory of the past, the gift will be appreciated. Colonel Armstrong proposes to retain control so long as living, but will begin and complete many improvements, with due regard to preserving the natural features of the forest. One of the restrictions will be a positive prohibition against destroying the timber, or even trimming the trees. The drives and paths will be made throughout so as to bring into view the beauties of the place, and water will be introduced in fountains at various points. The grounds are flanked by the foothills of Mt. Jackson, protecting the big trees from the winds, and there is no reason, except fire, why, with care, the park should not stand for all time."

Such a grand act as the rescuing of such piece of forest land from spoliation and the perpetual devotion of it to public instruction and recreation, should yield the donor much satisfaction in consciousness of well-doing. It will, of course, perpetuate the memory of the donor among men, but that to a man of Col. Armstrong's retiring disposition, is probably the smallest consideration involved. To preserve the trees he loves for the improvement, elevation and enjoyment of mankind, for whose ennobling he has always worked with voice and pen and purse—this is the grand central thought in the project, the realization of which we trust the donor may live many years to direct and enjoy.

SOLD A MINE.—Hans Bender, an indefatigable prospector, has sold an antimony mine in the mountains south of Sacramento canyon to an Eastern company, who will commence shipping ore forthwith. The ore is said to be worth $90 per ton in San Francisco.—*Silver State.*

SAWMILL BURNED.—The steam sawmill belonging to Johnson & Palmer, together with 40,000 feet of clear lumber and about 95,000 feet of rough lumber was totally destroyed by fire last week.—*Adin (Modoc Co.) Argus.*

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK. — Amador *Ledger*, July 26: Sinking at the Wildman is progressing. The pump has been lowered to its place, and keeps the water out in good shape. The mill is kept running steadily, and both superintendent and foreman are confident that it can be kept going through the entire sinking.

PLYMOUTH CON. G. M. Co.—Amador *Ledger*, July 26: The superintendent makes the following report: "The drift running south starts in No. 2 level with a crosscut west from the shaft about 130 feet, at which latter point the vein matter is cut, thence it runs south on footwall 1010 feet to end of drift. Seven hundred feet south from where the vein matter is cut by crosscut from the shaft, crosscut No. 1 east was started, which, to a distance 112 feet from the main drift, cut a ledge which is five feet thick in the bottom of the drift, and seven feet in top. On this vein they run north 25 feet, which appears to be the north end of the ore chute. They have run south on ore 50 feet. At this point the vein is five feet thick, the ore is good, and will mill from $10 to $12 per ton. Ten feet north of this point there was a break in the vein, and apparently it was the end of the quartz, but by breaking in east it is found that the ore continues. Three hundred feet south of crosscut No. 1, crosscut No. 2 was started, which was run east 183 feet when it cut ore that is two feet thick in the bottom of the drift and three and one-half feet in the top. The ore at this point will mill from $5 to $6 per ton—so it is, without douht, an ore chute 300 feet or more in length, of an average width of probably five or six feet, which, I think, is safe to calculate will mill $10 per ton. This being entirely new ground, and a long ore chute of good healthy looking quartz, carrying free gold and a fair per cent of iron, it will no douht extend up nearly to the surface, and, as it appears, will increase in width very much as it goes up, and will probably extend down several hundred feet. It must be an extensive body of ore. It looks now as though the old mine had taken a new lease of life, with a good prospect of many future dividends."

MISCELLANEOUS. — Mayne Warren, a mining expert of S. F., is superintending operations at the Clinton Peak mine, which has been recently bonded by the managers of the Clinton Con. Co. Operations are confined to running a tunnel to strike the lead. This tunnel is in a distance of 80 feet, with about 80 feet farther to go to reach the ledge.

AT THE AMADOR gold mine things are running along smoothly. The mill is kept going, with from 40 to 50 stamps in motion. The sulphurets, of which the rock turns out considerable quantities, are said to be of high grade—far above the average in fact. At the Hardenburgh or Casco mine at Middle Bar they have not reached the bottom of the shaft yet. They have met with unexpected difficulties.

El Dorado.

SALE OF GRAVEL MINES.—El Dorado *Republican*, July 26: An important sale of gravel mining properties has just been consummated in this city and a company formed to work the old river channel deposits east of the Benfeldt or Rogers mine. The property purchased includes the Shepler ground, the Anderson claim, the toll-house property and Cowan ground, the whole aggregating nearly 200 acres. The purchasers are H. L. Robinson and James Blair of this city and W. P. Stanley of Cleveland, Ohio, the latter, we understand, investing very heavily. Mr. Stanley is interested in the Melton mine at Grizzly Flat and has been in this county at various times looking after that property. Arrangements are being made to open the ground at once, and the first work will be done at a shaft about 300 feet northeast of the toll-house. A small engine will he moved up from the Barnes mine to pump out the water and hoist. The Rogers mine which adjoins this property on the west has recently been showing some very rich gravel.

Inyo.

CERRO GORDO.—Inyo *Index*, July 26: All predictions of the chronic kickers to the contrary, Cerro Gordo will hoom again. Surprising as it may appear, the many efforts which have been made to entangle and discourage the new companies have not stopped the work of development. They have neither driven the companies from the camp or the county, nor have the malcontenis been ahle to prevent the discovery of pay ore. A recent inspection of the Union mine shows a body of fine lead, going about 75 per cent and running high in silver. In the Dunphy & Keefe mine, the shaft is down 50 feet in ore, assays showing 60 per cent lead and 65 ozs. of silver. There are now over 50 men in the camp, and the number will probahly soon be largely increased.

Mariposa.

WHITLOCKS.—Mariposa *Gazette*, July 26: The pump and some other mining machinery at the Whitlock mine belonging to Judge Walker was lately purchased by Ellingham & Grove. Mr. Ellingham will soon have a fine plant at his mine on Whitlocks.

HART.—The Hart mine under the management of the Sebastopol M. Co. are down to the 100-foot level, and commenced drifting last Thursday.

MALONE.—The Malone is now under full headway, under the superintendence of Mr. Koch, Twelve men are employed at the mine, with John Mitchell as foreman.

Nevada.

THE COE MINE.—Grass Valley *Union*, July 26: There is a prospect that the Coe quartz mine may he started up soon by San Francisco parties, who will operate nnder a fifteen months' hond ohtained on the property by Chas. Stocks. It is expected that the money necessary to operate with will be secured by August 1st.

ANOTHER LEVEL.—The Idaho Co. is preparing to sink for another level, which will be No. 18. The present depth of the mine is about 2200 feet on the incline.

THE MENLO PROPERTIES.—Grass Valley *Union*, July 23: The new shaft on the Wisconsin mine has heen sunk to the depth of 140 feet, and with a change into hard ground the ledge is beginning to show up in high-grade ore, which carries handsomely in free gold and sulphurets. There has been quartz in the shaft all the way down, hut it was not very good in appearance nntil the water was reached and the ground became hard, when there was immediate improvement and gold made its appearance. At this point the fissure is five feet between walls, within a vein of 18 inches, and nnderneath on the footwall is a stringer that is rich. From appearances the ore now in sight will run from $40 to $50 per ton, and it is believed that it will prove an extensive body. A station is heing cut out at the present depth (140 feet), and in a short time drifting and stoping will be commenced. Excellent results are anticipated. At the Homeward Bound the main incline is heing sunk helow the 250 level, and the drifts are heing extended hoth north and south on that level. The vein in the drifts is from 2½ to 3 feet in size, and the ore by milling assays goes to $20 per ton. The vein in the shaft also prospects well, and carries plenty of sulphurets. Altogether the Menlo properties are showing well, and are giving every indication of being profitable. Supt. Wiltse feels much encouraged by the developments.

Plumas.

GREEN MOUNTAIN MINE.—Plumas *National*, July 26: We are informed hy those who know the facts that there has been a partial change of ownership in this extensive lot of mining property. Mr. G. P. Cornell has purchased the one-half interest helonging to Mr. Rogers—Messrs. Goodwin & Goodwin still owning the other half. This property has been lying idle for several years, and as is always the case under such circumstances, has become somewhat out of repair. Under this change it is proposed to commence active work to restore the property to its former capacity and productiveness. The improvements upon the property are extensive and of great value, and with a little money and energy the mine may soon be made a source of great profit to its owners and of prosperity to that section of our county. Mr. Cornell will supervise such work as is thought necessary for the present.

Shasta.

NEGOTIATING FOR MINES.—Redding *Free Press*, July 26: It is rumored about town that a hig English syndicate—if not the Sierra Buttes Co. itself—is negotiating for a number of mines on Squaw creek and is in the Old Diggings district. It is said that if this syndicate gets the properties it is after, the mining industry in that neighborhood will receive an impetus never before equaled in Northern California. It is proposed to huild a network of railroads or tramways connecting the ore dumps of the various mines with an immense milling plant situated on the river or creek hank at or near either Copley or Kennet. A system of tramways as proposed would greatly reduce the cost of milling hy doing away with slow transportation and the necessity of a number of small plants, say one on each mine for instance. By concentrating the machinery and power, lower grade ores may be worked with a profit to a better advantage than higher grade with an inferior small plant. If the syndicate ohtains control of the mines now under consideration, as we hope it may, Squaw Creek will hecome the liveliest mining camp in the northern end of the State. Not less than a thousand men would he put to work for this one Co. alone, and the earnings of this hig force would support at least 200 others in various lines of husiness and traffic.

Sierra.

SIERRA CITY.—*Mountain Messenger*, July 26: Once more times are lively here, all the men heing at work in and around the quartz and gravel mines. The Wm. Tell ledge continues very rich, and is thought to be an extension of the Sierra Buttes. The Hughes Bros.' gravel diggings have yielded handsomely this season. The Sierra Buttes Co. employs 11 men, in charge of No. 9 and upper tunnels, mill, flumes and ditches. Colombo Co. runs 10 stamps and employs 15 men. Work is being energetically prosecuted at the Mountain quartz mine. The mill building will be commenced this week. Ditch and flume will be done hy Aug. 15th. Average value of ore is $8 a ton—low estimate. Later developments show a much higher grade of rock. Mill will be capahle of treating 100 to 120 tons a day. Cost of mining, milling and transportation of ore will not exceed $2.50 a ton. The mine is opened to a depth of 700 feet, with at least two years of ore in sight for the 40-stamp mill.

Siskiyou.

QUARTZ AND PLACER.—Yreka *Journal*, July 23: The quartz mill of Coyle & Jacobs will be started up in a few days at Henley, for crushing 100 tons of blue cement like gravel, from the Black Jack Co.'s claim on Cottonwood creek, near that place. If this gravel turns out rich, there is an ahundance of it in the vicinity of Cottonwood creek and Klamath river that can be mined to good advantage. The Quartz Hill M. Co. are now working their claim at Scott Bar hy hydraulic process, hlasting the decomposed quartz so that it can be run into the sluices. The quartz is rotten and crumhles easily hy the force of power and water, except where masses of quartz are held together hy gold which can be picked out hy hand. As soon as the ditch is cleaned out and repaired from the effects of last winter's storms, the company will secure sufficient water-power to start their mill in crushing the solid quartz taken out ready for crushing. The San Jose Ditch Co., at Scott Bar, is also doing good work in taking out considerable gold hy hydraulic process, expecting to realize the hest yield ever known in that claim, between now and winter. Wright and Fletcher and Eastlick Bros., at Oro Fino, have made a cleanup in their hydraulic mines, with very good success for the present season's run, there having been an ahundance of water to ruo the giants much longer than usual. Campbell of Quartz Valley has been running his hydraulic mine this season with the greatest success, in consequence of the good supply of water, which will last prohably five or six weeks longer in supplying his giants, which have been kept in steady operation day and night since commencing work at close of winter storms. The Klamath river miners are now husily engaged in preparing to hoist pay gravel from hedrock, and some of them are already hoisting, having reached the channel in the cuts made.

Trinity.

NEW RIVER.—Trinity *Journal*, July 26: Stephen Sherwood of New River is in town this week. We get the following items concerning the camp from him: The past winter was so severe that it is only recently that the majority of the mines of New River could he worked. Work has been pushed on the Sherwood mine and since the middle of June over $1500 have been taken out. The mine is now leased. Williams & Hennessy have a lease and Miller, Vaughan, Strong and Ellison have leases. The lessees are taking out ore and running the arastra. The prospects for the mine are good. The Ridgeway resumed operations last Monday. The company will run from the tunnel up to the ledge in the bottom of the shaft. After striking the ledge the company will take out ore and crush. They have a fine stamp-mill. Ladd & Clemens are taking out good rock from the Mountain Boomer mine, and are crushing the ore in their stamp-mill. The Mountain Boomer has been one of the steady dividend-paying properties of the camp. G. V. Hely is taking out good ore from his ledge adjoining Sherwood's and is running his mill. Colgrove.is taking out good ore from the Excelsior mine. Work is progressing satisfactorily on the Uncle Sam, owned by Thynge, Bolles, Gulich & Dennis. They have out some good rock and will hegin crushing as soon as they have finished putting the new boiler in their mill. Smith Brooks is running a tunnel on the Mary Blaine mine, and near him Lindsey is working on his ledge. Ladd & Clements are working some men on the Hunter mine. On the New York Ellen the assessment work has been done; probahly that is all that will be done this year. Work is heing done on the hig ledge on Virgin creek. The ledge is from 60 to 70 feet wide and there is an immense body of ore in sight. A working test of the ore went $120 to the ton. However, the whole ledge will not average that. The camp is picking up after the hard winter, and the prospect for good times this summer is promising. There are not so many men in camp as usual, hut a good deal of work is now going on. In Mr. Sherwood's opinion, the prospect of the camp is better than it has been for years.

NEVADA.

Washoe District.

ORE AND BULLION YIELD.—Virginia *Chronicle*, July 26: This week's ore yield of Comstock mines aggregated 7225 tons divided as follows: Consolidated California & Virginia, 2372 tons, assay value $16.10 per ton; Savage, 511 tons, assay value, $21.33 per ton; Hale & Norcross, 1070 tons, assay value, $15.34; Yellow Jacket, 500 tons, assay value, $22.75; Crown Point, 842 tons, assay value, $19.20; Justice, 191 tons. assay value, $31.94; Alta, 360 tons, assay value, $20.50; Overman, 541 tons, assay value, $17.63; Chollar, 506 tons, assay value, $18.68; Belcher, 332 tons, assay value, $30.53. Following was the hullion yield of the ore product from each of the above mines, estimated on the prohability that 80 per cent of the value of hattery sample ore pulp assays was returned: Con. Cal. & Va., $30,500; Savage, $9160; Hale & Norcross, $13,180; Chollar, $7500; Yellow Jacket, $9100; Crown Point, $13,000; Overman, $7660; Alta, $4600; Justice, $4900; Belcher, $8130. Total, $107,780.

SIERRA NEVADA. — On the 630 level at a point 16 feet from the face of the west crosscut, 600 feet from the shaft station, a north drift is advanced 105 feet, continuing in quartz, clay and porphyry showing low assay value.

UNION CON.—On the 1465 level from the north lateral drift, opposite west crosscut No. 4, east crosscut No. 1 is advanced 614 feet. Continuing in porphyry carrying some clay separations.

MEXICAN.—On the 1465 level, east crosscut No. 1, opposite west crosscut No. 5, is advanced 24 feet in a porphyry formation carrying low-grade quartz, most of which appears in the top of the crosscut.

OPHIR.—On the 1300 level, the winze at a point 10 feet southwest of the raise is down 100 feet. The winze continued in low-grade quartz to the depth of 92 feet, at which point ore was cut and is still showing in the winze bottom, where an excavation large enough for another set of timhers, all in ore, has been made.

CON. CAL. & VA.—The 1300 and 1500 levels continue to yield the usual quantity of ore. There has been extracted during the week from all parts of the mine 2128 tons and 1020 pounds of ore. Shipped to the Morgan mill 451 tons and 1670 pounds of ore, and to the Eureka 1676 tons and 1350 pounds, battery sample assays showing an average value of $16.10 per ton (2372 tons milled). Shipped hullion valued at $56,166.14 to the Carson mint.

CROWN POINT.—Shipped during the week 841 tons of ore, showing an average value of $19.20 per ton hy pulp assays. The pay ore in the 300 level east stope is six feet in width, and that in the south stope is growing narrower.

CONFIDENCE & CHALLENGE. — Joint Imperial south lateral drift from west crosscut No. 1, 1000 level, is out 32 feet, face in porphyry. The joint Imperial north lateral drift is out 415 feet.

BELCHER.—Shipped during the week 332 tons of ore showing a value of $30.53 per ton hy hattery samp'e assays, A joint Seg. Belcher winze, near the south line, is down 12 feet below the 1300 level, bottom in low-grade quartz and porphyry.

SEG. BELCHER.—A winze helow the 1300 level, directly under raise No. 1 ahove that level, is down 12 feet.

JUSTICE.—During the week crushed 191 tons of ore showing a value of $31.94 per ton hy hattery sample assays. The winze helow the 622 level is down 145 feet; bottom in low-grade quartz.

ALTA.—The ore output this week was 320 tons, showing an average assay value of $24 per ton hy pulp assays.

OVERMAN.—Shipped 523 tons of ore during the week showing an average value of $17.63 per ton hy hattery sample assays, of which $10.22 was gold.

BEST & BELCHER.—On the 1200 level west crosscut No. 1 is extended 96 feet. Formation, clay and porphyry with some quartz.

GOULD & CURRY.—On the 400 level the northwest drift is extended 219 feet. Formation, soft porphyry.

UTAH.—On the 725 level the south drift is advanced 175 feet. Formation, vein porphyry and clay.

SCORPION.—The southwest drift from the 600 level shaft station is advanced 698 feet and continues in clay and porphyry.

OCCIDENTAL CON.—Continue to extract ore of fair quality from the stopes on the 400 and 450 levels. The crosscut from the bottom of the winze below the 550 level has reached the wall and is stopped. The material passed through was low-grade quartz.

ANDES.—On the 420 level the north drift from west crosscut No. 2 is in 88 feet. Formation, quartz, clay and porphyry giving low assays.

SAVAGE.—Shipped 511 tons of ore showing an average value of $21.33 hy battery sample assays. The 1300 level north drift is in 117 feet and the west side continues in good ore. There are 10 sets of timhers in place following the ore. At a point 40 feet south of the face there are two square sets in ore. A winze is sunk 12 feet at this point, the bottom in good ore. Bullion on hand valued at $20,000.

HALE & NORCROSS.—Shipped 1072 tons of ore during the week showing an average value of $15.34 per ton hy hattery sample assays. Bullion on hand on July account valued at about $28,000. Ore shipments suspended pending repairs to shaft.

WARD COMBINATION SHAFT.—The 1800 level east drift is advanced 415 feet and the west 453. Both continue in porphyry.

CHOLLAR.—Extracted 506 tons of ore, hattery sample assays showing a value of $18.68 per ton. Repairs to the timhering of the 850 level east crosscut No. 2 in progress.

POTOSI.—On the 850 level the south drift from east crosscut No. 4 is heing repaired. The south drift from the 1030 level station of the winze below the 930 level is out 27 feet, the face in quartz and porphyry.

ALPHA.—The 600 level east crosscut No. 2 is in 67 feet from the shaft, face in clay and quartz. The 600 level southwest crosscut is in 95 feet, the face in low-grade quartz.

EXCHEQUER.—The 500 level east crosscut is in 87 feet, the face in porphyry. The 600 level north lateral drift is out 396 feet; face in porphyry and quartz.

CON. NEW YORK.—The 650 level west drift is advanced 420 feet, the face in porphyry. The north drift from the top of the raise ahove the 800 level is out 378 feet, the face in porphyry.

IMPERIAL.—The 750 level west crosscut No. 3 is in 296 feet, the face in porphyry. The 1000 level west crosscut No. 1 is in 184 feet, the face in harreo quartz.

YELLOW JACKET.—Shipped 500 tons of ore showing average assay value of $22 hy hattery sample assays. The 500 level east crosscut No. 1 from the south drift has entered fine quality ore, four feet being exposed yesterday, assays showing a value of $100 per ton.

Delker District.

THREE MINES.—White Pine *News*, July 20: Chris. Delker has been prospecting in the Butte range and brought with him some rich specimens of gold, silver and copper ores. The district which hears his name is situated about ten miles southwest of Sprucemont in Butte Valley, Elko Co. The three principal mines of the district, of which he is owner, are the North Star, Lone Star and Black Jack Logan. The ore goes largely in copper, but also carries free gold and silver. Assays made from the rock give 45 per cent copper and $22 in gold. The mines are easily accessihle hy a good wagon-road.

Osceola District.

THE NEW DITCH.—Cor. White Pine *News*, July 20: The new water ditch is finished and the company is going to erect quartz mills on the waterfalls. Thus outfitted, our district will he unsurpassed for cheap mining and milling of ore. Our free gold helt is six miles long, and the ledges are all large and lay in a kindly quartzite and porphyry formation.

Robinson District.

GOOD LOOKING PROSPECTS.—White Pine *News*, July 20: The Aurora and Mt. Morgan mines in Robinson district, recently honded hy J. B. Williamson from Thomas Rockhill, are showing up fine. In the Aurora a crosscut run 45 feet one way and 35 the other is all in pay ore. Mr. Williamson feels confident that these honded properties will show up sufficient inducements to command the attention of men seeking profitable investment before snow flies.

Taylor District.

BROWN BULL.—White Pioe *News*, July 20: We learn from a gentleman from Taylor that Bro. Simpson has made an important development in the Brown Bull. Boh has stayed with it for five long years and deserves success.

BRITISH COLUMBIA.

BIG STRIKE REPORTED AT FIELD.—Nelson *Miner*, July 16: Reports come from the upper country that 15 men are at work running a tunnel on the Lanark mine and two on the Maple Leaf. The Carihoo Creek M. Co. is also expected to resume work during the month. These properties are all close to Illecilleweat. It is also reported that a great strike has been made in the Monarch mine at Field, and that an option on the mine has been ohtained hy the owners of the Revelstoke smelter. The Monarch was opened up in the fall and winter of 1888, and 1500 tons of ore shipped from it to the smelter at Vancouver, the smelter being huilt on purpose to work its ore. The smelter was a failure, owing to faulty construction and had management, and has since heen sold for scrap-iron. If the Revelstoke smelter people get control of the Monarch and adjoining claims, the smelter will prohably start up within 30 days. It is a complete one in all its appointments.

ARIZONA.

IN THE BRADSHAW MOUNTAINS.—Arizona *Journal-Miner*, July 24: The Rapid Transit mine in the Bradshaw mountains is one of the most promising mining properties in this Territory. It has been opened up systematically for heing worked economically. The Silver King mine on Groom creek continues to improve with development. In cutting out a station at the 130-foot level, a large hody of very high-grade gold sulphurets was struck. Superintendent M. R. Kiley of the Ryland Mining Co. says everything is prosperous in his camp. F. M. Murphy has deeded the Silver Trail and Smith mines, Hassayampa district, and Chalcedony and Jasper mines, Big Bug district, to Diamond Jo Reynolds, for $14,000. J. D. Helm has taken a hond on the Tiger mine and mill in the Bradshaws. A pack train arrived last night from the Bradshaw mountains loaded with ore helonging to S. Mott of

ie Silver Prince mine. W. J. Wright has sold the Good Luck mine, Pine Grove district, to W. C. Ashford. Jacob Smith has sold one-fourth of the Vire Gold mine and mill-site to Jerry Benninghoff, or $1600. Alex. Carlisle has sold one-half of the Grapevine mining claim, Hassayampa district, to Albert Tuttle, for $1000. W. M. Claypool reports good business at the sampling works. A rich strike f gold ore is reported near Iron Springs. Discoverers f the strike are keeping mum until they can get heir locations filed.

TURQUOISE. — Tombstone *Prospector*, July 24: Owing to the condition of the roads ineident to the rainy season the daily shipments of ore from the roperties of this company vibrate from 15 to 20 ons, this being shipped to El Paso. This amount f output could be trebled without taxing the reerve showing in the Silver Bill alone. On the th of the month sinking was resumed on the main Silver Bill shaft. Over 6000 tons of second-grade re grace the dump.

COLORADO.

THE RED OXEN.—Georgetown *Courier*, July 24: Dr. Franklin reports the Red Oxen as improving right along. In the heading of the adit which is now n 305 feet there is a small vein of mineralized uartz which assays from 5 to 6 ounces gold and ounces silver to the ton.

LITTLE ALICE.—The water has been taken out f the Little Alice. Sinking the main shaft by contract is now in process. The shaft is already down 75 feet, and the present contract when finished, vill make its depth 275 feet. Drifting will then be ommenced.

PILOT KNOB.—James Blanton and Larry Butler re developing the Pilot Knob group of mines on Collier mountain, between Chihuahua and Montezuma. A tunnel has been run which has cut three f the group, all of which show more or less ore. Drifting is progressing east and west on the No. 3 rom the tunnel. In the heading of both drifts here is a vein of solid ore ranging from 4 to 6 nches in thickness which mills from 35 to 40 oz. ilver and one-fourth of an ounce gold to the ton nd 50 per cent lead. A carload will be shipped to Denver in about a week.

DAKOTA.

THE SMELTER.—Deadwood *Pioneer*, July 21: The Baby smelter continues in blast, treating, it is said, about 30 tons per day. A prominent mining man o-day visited the works and expressed himself surprised at the size of the plant, and states that Baby s a misnomer—that it at least is a well-developed niss. No one doubts any longer the ability of Prof. Carpenter to smelt these ores. The regular hipment of matte indicates success. A few persons, however, doubt if such a small plant will pay expenses, but that is something no fellow can find out, as the company keeps its business wholly to itself.

CHLORINATION WORKS. — Upon Sunday this plant was closed down and nearly all hands laid off, owing to some unfortunate break in the machinery which will necessitate some delay, as it is necessary to send East for the broken part. This plant has also been in very successful operation, saving, it is said, nearly the entire gold contents of the ore at a cost not exceeding four dollars per ton.

THE PLUMA.—The Pluma Mining Co. has valuable property, consisting of nine claims and fractions, located at the head of the east fork of Gold Run, adjoining the Homestake, Caledonia and Moultor mines. They also own a fine millsite of 11 acres on Whitewood creek, one mile distant from the mine. For the last five months' run on Pluma ore the cleanups aggregated a little over $35,000, the shipment of bullion for last March being $11,000, a magnificent cleanup for a 20-stamp mill.

IDAHO.

LOST RIVER.—Wood River *Times*, July 21: B. C. Willis and Wilkie Duniway are in town from the Lost River region. A revival of interest in the mines of that region promises to give the settlers a home market for everything they can raise. The Big Copper mines at Houston have been sold to a strong company who have already purchased the smelter attached, and are putting men to work. The company intends to keep 40 men steadily employed, and this will cause other properties in the vicinity to be worked. Near Era there are also signs of an early revival of interest in mine operations. It will be remembered that some years ago the Bannack Co. made a miserable failure there and that its $130,000 mill has since lain idle. What this wealthy company failed to do has been done by a company of three or four prospectors whose industry and knowledge of mining was their only capital. They own a claim in the same gulch as the Horn Silver, upon which they have generally put in the winters, working elsewhere in summer to earn money with which to buy their winter supplies. The claim is called the Ella, and it adjoins the Horn Silver on the same vein. By going about 200 feet deeper than the Horn Silver workings they cut the vein and found it over 12 feet in width and carrying such rich ore that a handsome profit has been realized upon several shipments to Blackfoot since spring.

LOWER CALIFORNIA.

THE CUCAPA PLACERS. — *Lower Californian*, July 24: An Indian came in last Saturday from the Cucapa country with 14 ounces of gold-dust for Mr. F. B. de la Pina, one of the concessionaires of the rich mining district in Cucapa mountains, where the gold was found. The Indian also brought a message from Victor Tapia, the manager of the property, who states that the district is proving itself to be very rich, especially in placers, which are very extensive. Twenty-five men are working within the district comprised in the concession, who are under the direction of Mr. Tapia and foreman, Luis Feliz. The latter gentleman is now in Yuma, where he went to secure 25 more men and also to purchase a dry-washing machine, which is said to be capable of washing 25 tons of dirt a day. The Cucapa placers are from one to two feet above bedrock.

ALAMO NOTES. — Two good showers of rain have blessed Alamo the past week. The Prineesa has struck a new streak that pays remarkably well. J. M. Albright's bonanzita in the Montezuma mine continues as depth is attained, and he is making money. The Arabella and Butler mines have started up with a full force. L. B. Howard is personally superintending them. The Alamo Mining Co. is having its adobe offices incased with lumber, and building an elevator and two ore bins. The big boilers have been set in place on the Indio and Ulises, under the direction of machinist McRae. Additional machinery arrived for the Princesa Co. last Sunday. Pedro Lopez has sold his one-fourth interest in the Aurora and Alamo mines, in Alamo, to Messrs. Rhodes and Russell of that camp, for $10,000 cash. The Aurora was one of the very first mines discovered in the camp, and has been steadily making money for its owners ever since. J. M. Gonzalez is part owner of the Aurora.

MONTANA.

ELKHORN BULLION. — Boulder *Age*, July 26: Four bars of Holter bullion came down from Elkhorn the past week for shipment East. Supt. W. C. Jones, of the Mono mine, reports having struck a fine body of good ore in that mine. Wm. Mitchell has sold to the Gladstone Mining Co. for $500 and other valuable considerations, the Mitchell and Highland Chief lodes, half mile south of the town of St. Louis. It is reported that Rod Leggat and John Brannigan of Butte have made a very rich strike of gold ore on a claim of theirs in the Cardwell district, about four miles east of Whitehall. The Pilot, Amazon district, is shipping two carloads of ore a week to the Great Falls smelter, the returns netting $250 to $300 to the car. Next week the water will be turned from the Boulder river into the ditch on the south side of the river and operations will begin on the Taylor placer mine. The Elkhorn Mining Co. the past week shipped two cars of ore to the Great Falls smelter, and two cars are now at the Northern Pacific depot in Boulder awaiting transfer to the Montana Central depot for shipment to the Parrot smelter at Butte. The Lookout mine, Willow Springs district, does not make a satisfactory showing and work will probably be suspended this week, at least temporarily.

FINE SILVER ORE.—*Mining Review*, July 20: Mr. A. P. Dodge, general manager of the Big Ox mines, was up to the upper mines a few days ago and took out some ore from the pay streak that assays $480.90 in silver to the ton. This streak is fully three inches wide, and a foot of the vein will average $139.22. Capt. Jno. Roberts, the mining expert of the Big Ox Co., informs us he can stope out 300 tons of high-grade ore from this shoot alone.

FROM NEIHART. — The bond on the Moulton mine for $50,000 will be taken up to-day by a Great Falls syndicate. The mine is owned by John McAssy. The bond on the Compromise mine for $18,000 was taken up on the 12th inst. by a Great Falls syndicate. A good strike has been made in the tunnel of the Monarch mine. At present two shifts of six men each are being worked, but more men will be put to work about the first of next month.

CASTLE.—Mr. Suydam of Castle was here Monday. He is of the opinion that Castle is the greatest carbooate camp in the world. He thinks the Yellowstone is as good a mine as the Cumberland.

WHITLATCH UNION.—One of the best signs of the times is the iocreased activity manifested all around that famous old-time money-producer, the Whitlatch Union. That the almost abandoned camp was sure to be rehabilitated and Unionville rehuilt was never for one moment douhted by those who best knew the merits of the mines thereabout.

NEW MEXICO.

CAMP LOOMIS.—Cor. *Southwest Sentinel*, July 15: We have a new and prosperous camp in Lone Mountain mining district. After consulting all parties interested in the new strike recently made—which is now owned by Beall & Brockmann—I find they unanimously agree to name the camp in honor of the discoverer, H. W. Loomis. The Good Luck, the name of the new discovery, improves as work progresses, and sufficient has been done to insure a wonderful producer. Other claims are now being developed with most satisfactory results. The Missouri, owned by Bisby, Sweetland & Co., bids fair to develop a bonanza for them. Dan Rose & Bro. will commence work here soon on their Sunset mine. There is considerable interest manifested both here and at Lone Mountain. Some mines are changing hands; more good strikes are being made than is common; new men are coming in and taking leaseholds; old ones are returning.

OREGON.

SPARTA MINES. — Bedrock *Democrat*, July 21: The mines of Sparta, both quartz and placer, are making a very favorable showing this year and are giving proof to the statement that as rich quartz here abounds and as extensive gravel deposits are to be found as in any other district in Eastern Oregon. Between Sparta and Sanger many valuable quartz deposits have been developed this year, in many instances the ore proving wonderfully rich and justifying the expense of the erection of milling plants. At Paddy's Paradise, O. S. Buckland and others have developed a very rich deposit of gold ore and its permanency is assured. The Dr. Marrotte mine is proving a bonanza and a sale of the property to an Eastern syndicate, who will erect a 20-stamp mill upon it, is daily expected. George Henderson, owner of the Del Monte mine, has negotiated with a prominent Union Pacific official for the sale of a one-half interest in consideration of the purchasers erecting a mill on the property. Mr. Henderson is now on his way East for the purpose of purchasing the necessary machinery. The mill which he will select will be of the Griffin patent, with capacity of 50 tons per day. The Eagle canal is furnishing a large supply of water to placer miners this year and a large number of claims are being worked successfully. On Thorn gulch, Capt. E. E. Clough has a large force of miners at work and the ground is said to pay $3 to every square yard. At Shanghai gulch Clough and Graham are mining and the claims are paying fully as well as they did years ago.

UTAH.

THE FLAGSTAFF WORKS.—Salt Lake *Tribune*, July 23: Prof. Vincent is leaving London on an African trip, to return in October. At that time the rebuilding of the Flagstaff works will be decided. In the meantime the ore will be taken out through the Vallejo tunnel, connecting with the 600-foot level of the Flagstaff.

MINERAL WEALTH.—Mr. H. Donovan returned to Salt Lake yesterday from an extended trip down in the southern part of this Territory. He comes back highly elated with some fine specimens, not of gold, silver or lead, but of something that is as scarce and as valuable. He has one large lump of cleorite from the Blackhawk mine weighing about 40 pounds, and cut out of a solid mass from two to five feet in thickness. There is estimated to be 500 tons, and not half the deposit exposed. This has run out of the mountain from two different crevices, and as soon as exposed to the air becomes like wax. The owners of this mine are Mr. Donovan, ex-Sheriff John W. Turner of Provo, Mr. Jas. Bean, Mr. John Dounard and M. Stalter of this city. One other mine of which the same parties are the owners is the Blackbird; it is a jet mine and as bright as any jet ever imported here from England. This is the genuine, and is equal in quality to the English jet, but as that is becoming scarce, they have substituted other compositions. He also brought samples of the ozocerite from the Ozocerite M. Co. mine at Soldier Summit, about six miles west from Pleasant Valley Junction, where the same company has a solid 4-foot vein of this valuable wax or ozocerite and are down only 100 feet.

WASHINGTON.

ON THE COLVILLE RESERVATION. — Spokane Falls *Chronicle*, July 21: It is highly probable that when the great Colville Indian reservation is thrown open to settlement some of the richest mines in the world will be developed. A gentleman was in this city yesterday with a sackful of extremely fine specimens of gold-bearing rock and fine gold. He and a companion took the specimens from undeveloped diggings on the reservation, and as they have exhibited their find to almost every person between here and the Little Dalles, mining men are considerably wrought up, and it is not improbable that ere this other prospectors have gone into the forbidden region. The Little Dalles correspondent of the Colville *Miner* was last week shown the specimens. He is a mining expert, and his opinion that the stuff came from very rich diggings has added unusual interest to the find. The gentleman who had the specimens refused to tell even the approximate location of the rich ground. He purposes remaining in the vicinity of the big reservation, and, when it is thrown open, to locate his claim. He is confident he has a bonanza. For the past two or three years prospectors have been making surreptitious incursions to the heart of the reservation, but very few of them have found anything unusually rich.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 22, 1890.

432,851.—STUMP-PULLER—S. W. Baker, Olallo, Wash.

432,594.—VARIABLE ECCENTRIC — Dan'l Best, San Leandro. Cal.

432 929.—ROTARY WATER-METER—F. A. Bishop, S. F.

432 863.—STEAM-FOOD COOKER—Olive C. Christin, Brodie, Cal.

432,817.—VENTILATOR—Wm. T. Cottier, Oakland, Cal.

432,696.—WINDMILL—Evert DeWitt, Hanford, Cal.

432,934.—FIRE-KINOLER—Ford & Baird, Placerville, Cal.

432 827 —RAILWAY CATTLE GUARD—James C. Gould, San Jose, Cal.

432 730. — CABLE RAILWAY CONSTRUCTION—Geo. F. Gray, S. F.

432,732.—LIFTING JACK—I. N. Groves, Montesano, Wash.

432,477.—SALVE—W. R. Hall. S. F.

432 528.—RIVETING MACHINE—Harper & Hamlin, Los Angeles, Cal.

432,875.—WATER-WHEEL—C. C. Hogue, Corvallis, Or.

432,799.—BLIND-HOLDER—W. S. Holland, Pasadena, Cal.

432,876.—MIDDLINGS PURIFIER—R. I. Hottel, Cedarville, Cal.

432,670. — CONDUIT ELECTRIC RAILWAY — B. Jennings, San Jose, Cal.

432,944. — CONDUIT ELECTRIC RAILWAY — B. Jennings, San Jose, Cal.

432,831.—PENCIL BOX—H. Legge, S. F.

432,637.—LOADING ELEVATOR—Thos. McConnell, S. F.

432,954.—STREET-RAILWAY CAR — E. C. Sessions, Oakland, Cal.

The following brief list by telegraph for July 29, will appear more complete on receipt of mail advices:

California—Lucius E. Ashley, assignor of one half to A. Clark, Stockton, ditching and grading scraper; Daniel Best, San Leandro, wheel; Arthur H. Douchy, San Diego, valve and faucet; Geo. R. Driggs, San Francisco, water dyeing machine; Geo. Gibbs, assignor of one-half to F. A. Robbins, San Francisco, stock and die for cutting metal screws; John Jett, San Francisco, bicycle; Geo. H. Malter, San Francisco, aging wine; Edwin McDonald, willow washing machine; A. W. Reppy, assignor of one-half to T. C. Masteller, Oakland, automatic electric train signal; Thos. P. Mehwartz, Stockton, combination tool; Adrian R. Smith, San Francisco, feed-water heater and purifier; Dormer Walsh, assignor of one-half to F. H. Manker, San Francisco, game.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

VARIABLE ECCENTRIC.—Daniel Best, San Leandro, Alameda, Co. No. 432,594. Dated July 22, 1890. This is one of that class of eccentric mechanisms in which the eccentric disk is mounted and adapted to be moved upon the shaft to vary its position, and is therefore known by the title of "variable eccentric." The object of the invention is to provide a simple and accurately operating variable eccentric, which is accomplished by certain novel constructions and combinations of mechanism.

CONDUIT ELECTRIC RAILWAY.—Byron Jennings, San Jose. No. 432,944. Dated July 22, 1890. This invention relates to that class of electric railways in which continuous conducting rails are fixed within a conduit or tube, and upon which the wheels of the trolley are adapted to travel, said trolley being connected with the car and the motor thereon, so that a current of electricity conveyed through the rails will pass through the trolley to the motor through which the car is propelled. The object of this invention is to provide a more perfect means of conduction, to allow the conducting rails to expand and contract without interfering with their conductivity, and to provide a perfect conductor through the trolley-wheels and frame, to prevent dirt and foreign substances from falling upon the conducting parts so as to endanger the conductivity or insulation thereof, and to provide means for lubricating the moving parts of the trolley.

CABLE RAILWAY CONSTRUCTION.—Geo. F. Gray, S. F. No. 432,730. Dated July 22, 1890. This patent covers a certain construction of the roadbeds of cable railways. It consists in the novel frames which carry the track-rails and the slot irons, in the braces connecting adjoin-frames with the slot-irons, and in the means for securing the track-rails. The object is to provide simple and effective supporting frames or iron work of the roadbed, which, while being cheap and strong enough to answer all the purposes of such constructions, will permit the use of much less concrete than is generally employed.

LOADING ELEVATOR.—Thos. McConnell, S. F. No. 432,637. Dated July 22, 1890. This invention relates to that class of elevators used for the transportation of goods from one level to another and especially for the use of loading ships. The object of this invention is to provide an elevator of this class which is adapted to be self-supporting and adjustable to any desired inclination, thereby especially adapting it for loading ships.

SALVE.—Walter R. Hall, S. F. No. 432,611. Dated July 22, 1890. This is a medical compound to be used externally as a dressing for wounds, cuts, burns, old sores, salt rheum, eruptions of the skin, etc.

CONDUIT ELECTRIC RAILWAY.—Byron Jennings, San Jose. No. 432,670. Dated July 22, 1890. This device is specially applicable to what is known as the conduit system in which the electrical wires are stretched within a tube or conduit beneath the surface of the ground in such a manner that a trolley-wheel connected with a motor upon a car is allowed to travel in contact with the conducting wire so as to furnish a power to operate the motor. The invention consists in supports to which the conducting wires are fixed; in a means for automatically maintaining the tension upon said wires; and in a compensating device for the expansion and contraction of the wires.

Mining Share Market.

The mining share market has been decidedly mixed, with the leader in one group going up while the leader in another group went down, with another group only showing a slight variation in prices. The movements, so far, have demoralized the street; only those who are "steered" have been able to make successful turns.

Potosi at a break-neck speed broke nearly $3 a share, while Ophir moved up about $2 a share. After touching $5, Potosi began to advance and Ophir to set back after selling at $6. The stocks in each group moved to some extent in sympathy with the leaders. The moves were nothing more nor less than unadulterated manipulation, for the condition of neither the Ophir winze nor the Potosi winze or drift has anything to do with the fluctuations further than giving an excuse for the ups and downs. In all the mines interesting prospecting work is being done.

In outside stocks dealing has been quiet at generally lower prices.

A correspondent wants to know if the 30,000 tons of tailing from the Morgan mill does not belong to the Con. Virginia Mining Co. We are informed that tailings, etc., from the mills belong to the mill ring. This no doubt accounts for the ring being said to be opposed to mine or car sample assays, for they can have more hoodle.

The market opened this (Thursday) morning fairly active at higher prices in the North Ends and lower in the Middles.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

USEFUL INFORMATION.

SUGGESTIONS BY A PHOTOGRAPHER.—A prominent photographer, interviewed recently by a representative of the New York *Sun*, has given a number of valuable hints. This photographer says, what has been said many times, that few people stand before a camera without the expression, "I am having my picture taken," defeating their own object. The second difficulty is that materials having a gloss never produce good effects in a picture; but the majority of women, though they may own any number of dresses that fall in soft, clinging lines, persist in wearing new glossy materials that have not become adjusted to the figure.

There is nearly always the possibility of producing an attractive if not a beautiful picture of a child, if the child is left for direction to the photographer. In reply to the question, "What is the most annoying thing about your work?" the answer was:

"Oh, the fond mothers who insist on dressing children in garments heavy with frills, instead of the soft, fine little dresses that fall in pleasing lines. Then, too, they insist sometimes on having a foot or shoulder, or more often a sash or shoulder knot, show, to confusion of art and the destruction of unities; or they will dart out and twitch a little skirt or mantle that has fallen into natural curves of beauty, or a wandering curl, that falls in exquisitely careless grace, back into order and awkwardness again. That happened the other day when I was photographing a bride. She walked up to the chair, and as she turned to face me, the silk train and thin veil fell in wonderful folds of graceful outline. I told her not to stir, but while I stepped back to get the effect, her friend darted out and straightened the whole thing out like a flag in a head wind."

The same lack of artistic sense that placed the furniture in a room at right angles, still thinks the straight line the line of beauty, curves representing disorder.

ARTIFICIAL HONEY A MYTH.—The seasons of 1887 and 1888, especially the latter, were unpropitious for the "busy little bee," and yielded but little honey. The crop was a general failure, not only in America but also in Europe. The modicum of honey produced, especially of comb-honey, was soon exhausted, and the dealers as well as consumers, North, South, East and West were crying out for honey. The producers were inundated with letters and orders which they could not fill. Now here was the grand opportunity for the manufacturers of "artificial honey." If the article could be sold "at an immense profit at half the price" of the genuine article, as Prof. Wiley assures us, these bogus manufacturers could have coined money—there were "millions in it" apparently. But they failed to appear. The glucose was available, the paraffine ditto, and the "appropriate machinery" ought, in the interval under the law of progress, to have become still more "appropriate" and perfect in its work; but, strange to say, the famine of honey continued. The tempting prices were offered in vain. Not a pound of the stuff ever "materialized," so far as anybody could find out.—*Ex.*

OUR POPULATION.—A telegram from Washington says the census will show that while the rate of increase in the Northern and Atlantic States has been about the same as usual, the Western States have increased at an almost fabulous rate. Of the Southern States, Alabama, Georgia and Texas will show a marvelous increase in population. The other Southern States will remain about the same. It is probable the census will show that the rate of increase among the blacks has fallen far behind the rate of increase of the whites. The Census Bureau is now enumerating the returns at the rate of 1,000,000 per day. As a matter of fact 2,000,000 a day are being counted, because on each day, besides the 1,000,000 new names counted, the 1,000,000 counted the previous day are recounted to insure absolute accuracy. It will take 60 days, and possibly 70, to complete the entire count, which it is reasonable to believe will be concluded about September 1st.

THE INVENTOR OF THE LETTER COPYING-PRESS.—But few people, we presume, are aware of the fact that among the numerous inventions of Watt, was that of the letter copying-press. In addition to the steam engine, with which his name is most intimately associated, Watt's other inventions are too numerous to mention, and most of them—such as the parallel motion, the governor, and the steam engine indicator—are well known to have come from him. But the very multitude of his inventions makes his name to be little associated with some of his most fruitful works. Had he made no other invention, or had he been of a more self-assertive disposition, his name would probably have become known wherever business is conducted, in connection with his invention of the method, still almost universally in use of copying letters by means of the copying-press.

GRASSHOPPER SOAP.—A Spanish inventor renders from grasshoppers a fatty substance which is declared to make the finest soap yet produced.

A NEW METHOD OF OBTAINING STAINED GLASS is done by a process of printing. The design is embossed on an iron plate, on which a lump of hot glass is rolled until it takes the form of the plate on which the pattern is cast. The sunken lines are then filled with enamel and the whole plate is fired. This process obviously does away with the use of leads, is rapid in its execution, and has the additional advantage that the design may be repeated as often as it may be required.

GOOD HEALTH.

The Prevention of Sunstroke.

The following hints for the prevention of sunstroke are given by Dr. Erwin C. Mann of New York city, in an article upon this subject in one of the medical journals: "To avoid sunstroke, exercise in excessively hot weather should be very moderate; the clothing should be thin and loose, and an abundance of cold water should be drunk. Workmen and soldiers should understand that as soon as they cease to perspire, while working or marching in the hot sun, they are in danger of sunstroke, and they should immediately drink water freely and copiously to afford matter for cutaneous transpiration; keep the skin and clothing wet with water. Impending sunstroke may often be warded off by these simple measures. Besides the cessation of perspiration, the pupils are apt to be contracted and there is a frequency of micturition. If there is marked exhaustion with a weak pulse, resulting from the cold water application, we should administer stimulants. The free use of water, however, both externally and internally by those exposed to the direct rays of the sun is the best prophylactic against sunstroke, and laborers and soldiers and others who adopt this measure, washing their hands and faces as well as drinking copiously of water every time they come within reach of it will generally enjoy perfect immunity from sunstroke. Straw hats should be worn, ventilated at the top, and the crown of the hat filled with green leaves or wet sponge. It is better to wear thin flannel shirts in order not to check perspiration. We may expose ourselves for a long time in the hot sun and work or sleep in a heated room and enjoy perfect immunity from sunstroke, if we keep our skin and clothing wet with water."

SEVEN HOURS' SLEEP AT LEAST.—There is not one man or woman in 10,000 who can afford to do without seven or eight hours' sleep. All those stories written about great men and women who slept only about three or four hours a night make very interesting reading, but I tell you, my readers, no man or woman ever yet kept healthy in body and mind for a number of years with less than seven hours' sleep. Americans need more sleep than they are getting. This lack makes them so nervous and the insane asylum so populous. If you can get to bed early then rise early. If you cannot get to bed till late, then rise late. It may be as Christian for one man to rise at 8 as it is for another to get up at 5. I counsel my readers to get up when they are rested. But let the ringing bell be rung at least 30 minutes before your public appearance. Physicians say that a sudden jump out of bed gives irregular motion to the pulse. It takes hours to get over a too sudden rising. Give no time after you call us, to roll over, gaze at the world full in the face, and look before we leap.—*T. De Witt Talmage.*

POISONING BY LEAD DUST.—Cases of lead poisoning among the jacquard weavers in a Swiss factory were traced to the dust from the leaden weights which are used by the weavers to carry the thread of their warp. After the varnish has been rubbed off from the weights, the lead begins to wear away and falls in fine particles among the dust on the floor. In some cases the dust was as much as 56.86 per cent lead, and even when the utmost care had been taken, nine or ten per cent of lead was found in it.

NOSE BLEEDING.—An eminent physician says: "The best remedy for bleeding at the nose is a vigorous motion of the jaws, as if in the act of mastication. In the case of a child, a wad of paper should be placed in its mouth, and the poor child instructed to chew it hard. It is the motion of the jaws that stops the flow of blood." This remedy, he says, is so extremely simple that many will feel inclined to laugh at it; but it has never been known to fail, even in severe cases."

THE GROWTH OF NAILS.—It is said that the growth of nails on the left hand requires eight to ten days more than those on the right. The growth is more rapid in children than in adults, and goes on faster in summer than in winter. It requires an average of 132 days for the renewal of the nails in cold weather, and but 116 in warm weather.

THE TASTE.—Different classes of substances have been found to affect the organs of taste in the following order: Bitters, acids, saline substances, sweets and alkalies. The taste nerves are nearly 2000 times as sensitive to quinine as to sugar.

BOILING MILK.—Experiments in St. Petersburg have shown that boiling milk greatly reduces its nutritiousness.

GOULD, with all his millions, has to walk the streets at night to induce sleep.

ENGINEERING NOTES.

Relative Costs of Transmission of Power.

The following comparisons of cost of transmission of power by various methods appeared in the *Revue Universelle des Mines:*

1. Comparative cost on 10-horse power transmitted 1093 yards: By cables, 1·77 per effective horse-power per hour; by electricity, 2·21; by hydraulics, 2·90; by compressed air, 2·98.

2. Comparative cost on 50-horse power transmitted 1093 yards: By cables, 1·35 per effective horse-power per hour; by hydraulics, 1·87; by electricity, 2·07; by compressed air, 2·29.

3. Comparative cost on 10 effective horse-power transmitted 5465 yards: By electricity, 2·64 per effective horse-power per hour; by compressed air, 4·66; by cables, 4·69; by hydraulics, 5·29.

4. Comparative cost on 50 effective horse-power transmitted 5465 yards: By electricity, 2·37 per effective horse-power per hour; by cables, 2·65; by compressed air, 2·99; by hydraulics, 3·02.

Steam was the prime mover used in each of the above instances, and it appears that for long distances electricity takes the lead in economy over all other systems. It has also a great advantage in the facility with which the power may be subdivided, and there appears to be no doubt that in future coal mining, electricity will be much used for coal cutting, tunneling, hauling, pumping, etc., as well as for lighting.

THE GREAT ENGINEERING FEAT IN UPPER INDIA.—An article in the Allahabad *Pioneer* gives some interesting particulars concerning the tunnel that has just been completed through the Khojak on the railroad from Quetta to Candahar. The Khojak Pass is 7500 feet above the sea and about 2000 feet above the level of the surrounding country. The tunnel pierces the range at right angles and its course is therefore due east and west, and it enters the hill at about 1000 feet below the crest of the pass. The length of the tunnel is two and a half miles and it will carry a double line of rails. The magnitude of the work is testified to by the banks of rock at the months of the tunnel and at the pit-heads, which are said to be quite altering the landscape. One curious discovery made during the progress of the work, as the result of an investigation into the cause of certain mysterious explosions, was that it was proved that "combustion had arisen inside a case of blasting gelatine."

BRIDGING BEHRING STRAITS.—"They can talk about my uncle as visionary and a mild lunatic all they please, but the day will come, and it is not so far off, either, when he will be recognized as a thoroughly sensible, though bold, engineer." So said William Henry Gilpin of Pueblo, Col., at the Hoffman house, New York, recently. Gilpin has been for the last two years with his uncle, Wm. Gilpin, ex-Governor of Colorado, in a tour of reconnaissance on the Northern Pacific Coast. William Gilpin believes that there is no serious obstacle in the way of building a railroad which will join the United States and Russia by way of Siberia, Behring straits, Alaska and British America. The only apparent difficulty is in crossing Behring straits, but this difficulty is only apparent. The straits are only 40 miles wide, and in the middle lies an island big enough to hold New York, Brooklyn and Jersey City combined. The water is nowhere more than 40 feet deep, and there will be no trouble in erecting piers on a hard bottom.

THE IMAGINATION IN ENGINEERING.—The imagination is a pretty powerful factor even in the matter of engineering. The engineer knew this who once said that if he could find a bright paint that would stand in his fire-box he could obtain any number of commendations as to the splendid condition of his fires; but evidently the engineer did not know it, who once said that the sunlight put out his fires. The sun shone for a few minutes into the fire-room and he was ready to prove it to any one by opening the furnace door when they could see the fire become less bright. He did not consider what a powerful light the fire had in the sun to contend with.

A NEW CANADIAN SHIP CANAL.—The Canadians, who have shown a great deal of enterprise in the matter of building ship canals and in other wise providing for the increase of transportation facilities through their territory, have now under contemplation another scheme which will shorten the route between Chicago and Toronto some 600 miles. It is no less a plan than the building of a ship railway from the Georgian Bay about 66 miles to Toronto.

A COMPANY to utilize underground water for irrigation and other purposes has been organized at Pueblo, Col. The projectors claim to have discovered a point where by placing a dam on the bedrock of a valley 500 yards wide, a flow of a million gallons of underground water per 24 hours will be stored.

JAPAN AND CHINA.—While Japan last year celebrated the completion of 1000 miles of railway, China has at present only 87 miles of road; but a decree of the Chinese Emperor, directing that work on a railway 700 miles long should be undertaken, has been welcomed by the ablest statesmen of the Empire, who have all declared themselves in favor of the proposed improvement.

ELECTRICITY.

Electrical Railways.

Their Success Established Beyond a Question.

In a recent lecture at the Franklin Institute, Philadelphia, Capt. Eugene Griffin said: "The success of electrical propulsion has been established beyond a question. It is only a matter of time, and that a short time, when it will replace the horses on the majority of our street railways. It is only a matter of time, a somewhat longer time, perhaps, when it will be the propelling power on all our elevated railroads, for the elevated roads possess ideal conditions for the application of electricity. It is within the bounds of possibility that our steam roads will be run with electricity; certainly this power offers many advantages for the suburban traffic in the vicinity of large cities. The possible utilization of hitherto neglected water powers will be one of the factors in determining the extension of electrical propulsion in this direction. Already we see the beginning. The West End Company of Boston is building longer cars, with radial and double swiveled trucks. The New York elevated roads are anxiously seeking a solution to the problem of how to enlarge their carrying capacity without rebuilding or materially altering their superstructures. Longer trains are requisite to meet the increased demands. The limit of the capacity of the present locomotive has been reached. Increased weight in the locomotive means an immense expenditure for strengthening or practically rebuilding the roadway. Cables are not feasible, as the strain on the grip would not permit of long trains, and it would be difficult to combine speed and safety with any considerable increase in the number of trains. Cables would not permit of satisfactory switching arrangements at the termini and elsewhere.

Electricity offers the best solution. Equip each car with motors. Flexible electrical connections can easily be made from car to car, as is now done on surface roads, to light the tow cars, and the whole train controlled by the driver on the front platform of the leading car. Electric, vacuum or air brakes can be used in the same way. It matters not how many cars we have in a train—one or fifty. Each car adds its own power and all work together. There is no dead weight to pull, as in the case of the locomotive. The passengers themselves furnish the weight for traction. The switching arrangements present no difficulties whatever. The motors can be reversed and run equally well in either direction. The train can be controlled from either end and any increase or decrease in the number of cars will not affect the controlling mechanism. "It is difficult to conceive of a more flexible system. It seems to be the ideal system for the elevated roads, and is bound to be adopted in the near future."

Still Further Evidence.

Prof. Elihu Thomson, in speaking on "The Problems of the Future," says: "In the near future railways will be run by electricity; not the small roads, I mean, but really the large ones connecting cities, and there is no reason why we should not expect higher speeds than we can attain at present with our steam locomotives. There we have reciprocating parts that must be put in motion, stopped and reversed continually, while in the electric locomotive we have the simple rotary motion, which is all we need, which makes it possible accordingly to run at a much higher rate of speed. Although the steam locomotive has been very much improved, yet it can hardly compare with the economy of stationary engines, placed where they can have an abundant water supply for condensing purposes. We can, therefore, by employing stationary engines and electric roads, do away with a great deal of unnecessary weight, and the moving parts being symmetrical, we can attain a much higher speed, say a hundred miles an hour. This would be a grand step forward, which would save us a great deal of time. It might even be possible to reach a speed of 150 miles an hour. It simply depends upon finding the method of applying sufficient power, and building the locomotives to suit, arrangements being adopted to keep the cars on the track."—*Scientific American.*

ELECTRICITY AS A MOTIVE POWER.—New England manufacturers are beginning to introduce electricity into their factories as a motive power by subdividing it into units. It is found that such a method results in a considerable saving of power over the use of a single motor for all work. The first cost of a number of motors is greater than if a single motor was used; but the saving soons covers the extra expense. A shoe factory at Brockton, Mass., divides its electric power into three parts. Formerly, one motor of 25 horse power ran all the machinery. The division, it is estimated, saves over one-fifth of the former expenditure for power. With a single motor the full power had to be constantly kept up; by dividing, one motor can often be left at rest, resulting in a material saving of power.

MECHANICAL PROGRESS

For Reducing the Cost of Steam.

New devices in boiler and furnace construction are constantly being proposed, to reduce the cost of making steam. Other devices in the way of substitutes for water, such as ammonia, bisulphide of carbon, etc., have also been tried and abandoned as impractical. One of the latest propositions is that of a French engineer, M. Tellier, who proposes the use of

Gas and Steam in the Same Boiler.

By this scheme, M. Tellier claims to be able to produce motive power by using a combustible gas, employing the heat generated by its explosion to generate steam, and the vapor of ammonia. When the gas has operated on the piston, it escapes at a temperature of about 400 degrees into a generator, where steam is produced, which is used to act upon the opposite side of the piston from the gases. There are two advantages claimed for this—the high temperature due to combustion of the gas prevents cylinder condensation, and the steam assists in lubrication. The completed machine for which this claim is made will consist of two cylinders, one making its forward stroke under the action of the explosive gases, and its return stroke by the action of steam; the other is operated entirely by vapor of ammonia. Under these conditions, says M. Tellier, there can be no doubt, theoretically or practically, that .44 pounds of coal per horse-power per hour is an economy which can be secured.

Steam by Electricity.

Hints have recently been thrown out of a device for making steam by the direct action of electricity, which has been put in operation, experimentally, in New Orleans. The character of the machinery employed for this purpose, says the *Times-Democrat* of that city, has been jealously guarded; but a reporter managed to get into the room in which the plant is located, and this is what he found:

To a battery of two 20 horse tubular boilers, a 10-horse engine and boiler is temporarily connected to heat the water in them; steam is first raised in a small boiler, and a dynamo used to produce electricity. The flues in the large boiler are filled with asbestos, the ends are connected with a dynamo, and the passage of the electricity through the asbestos heats it to an intense degree, causing a rapid rising of steam. When the required pressure in the large boilers has been attained, the engine driving the dynamo is attached to the large boiler, and the work goes on as before.

In this way it is claimed that but 25 per cent of the power of the large boilers will be required to furnish 40 horse-power, leaving three-fourths of the power to be applied to other purposes. It is claimed that the power can be supplied in this manner to any required amount. The 40 horse-power could be used after starting to start up a 160 horse-power, and keep it moving without any cost whatever outside of keeping up the machinery. This is the first instance on record where power could be increased; nature has always worked the other way and demanded that a stronger should work the weaker, as the 40 horse-power to drive 10, and if this proves a success as is claimed, the company have the biggest discovery ever made in America, that will rank next to the discovery of steam power itself.

Contraction and Expansion in Steam Boilers.

One of the severest tests of the strength of a steam boiler is due to the unequal expansion and contraction of its different parts, owing to the effects of changes in its temperature. In the case of flue or tubular boilers, in which the flues or tubes are more directly exposed to the influence of heat than the shell, the strain thus developed is tremendous, the tubes or flues, or their material, expanding lengthwise with a force calculated to tear the heads out of the boiler. Where the flues are placed very near the bottom of a boiler, in which case the pressure is all on the lower side of the heads and the plates that keep them together, it is not unusual for these plates to be ruptured or the seams sprung underneath, causing troublesome and often dangerous leaks.

The smaller the proportion of the surface of a boiler that is exposed to the heat, the more active will be the effect of the expanding and contracting forces, and in the case of some boilers, set more than half exposed to the influence of the atmosphere, the tremendous power exercised by the expansive heat of the fire below and the contraction due to the low temperature above, are almost enough to tear the boiler to pieces.

It is the unequal expansion of shell and tubes and of the upper and lower shell, that really does more injury to a steam boiler than the expansion and contraction due to changes in pressure of steam; the leakage and cases of ruptures that so often occur in the lower seams and along the bottom of horizontally fired boilers are unquestionably due to these causes, and in very many instances forced firing in getting up steam on first starting the boiler is to blame.

To avoid the injuries so often caused to boilers in this manner, it is necessary therefore, to exercise great care in raising steam in new boilers or those that have been blown out and allowed to cool down.

The fire should be raised moderately and gradually and the boiler moderately filled with water, so that the increase in the temperature may be gradual. In cooling off a boiler the same care must be exercised. The plan adopted by some engineers, of turning a stream of cold water into the boiler as soon as it is emptied, cannot be too severely condemned, nor should the furnace doors be too suddenly thrown open or any other proceeding taken that will result in suddenly lowering the boiler temperature, a rapid decrease in the heat being quite as bad for the safety and durability of the boiler as the immoderate and unequal increase above referred to.

AMERICAN-BUILT CARS FOR EUROPE.—The Jackson & Sharp Works, at Wilmington, Del., are building passenger cars for the railways in France, Spain and Austria. Mr. William Voss, writing about the cars after a visit to the works, says: They are a curious mixture of European and American practice, and are built according to complete sets of drawings sent over. Of course it is sectional work, like that sent to South America. These cars are about 50 feet long, some of them day coaches and others of the Mann bondofr style of sleeper. They have combination wood and iron sills, *bogie* trucks, the old country draw-hook and buffers, etc. All the heater and water pipes are of copper, windows run in brass guides (a very good but expensive thing). There is a vestibule at each end, but they do not touch like ours, being about four feet apart when coupled, and iron aprons and railings form the bridge. The entrance is through the vestibule and steps like ours, but *different*. The exterior is mahogany, natural wood finish. Roof much like ours, and is covered with canvas and sheet copper on ends and at eaves. Some of the cars have been shipped, six or 12 more are almost done, and a lot of six is just being erected.—*National Car and Locomotive Builder.*

A LARGE GIRDER FOR SAN FRANCISCO.—The Keystone Bridge Co. has just completed a girder for the New City Hall of San Francisco, which is the largest ever made in the United States, so far as the members of the firm know. It is 105 feet long and weighs 70 tons. A contract for two girders was given to the company. The materials for the second one are now being prepared. The girders are intended for the ground floor of the building. The great problem now is to transport it to the Pacific Coast. The Chicago & Northwestern and Union Pacific roads have undertaken the job. The long monster recently was lying on three of the largest freight cars obtainable on the Allegheny tracks. It was necessary to put in additional trusses to distribute the weight evenly on the three cars. The way it is placed in the cars will allow it to go around the curves all right. The usual plan for shipping girders is to carry them in pieces and have the plates riveted together at the place of destination. The company was afraid they didn't have the facilities on the Pacific Coast to do the riveting. The second one will not be built until they see whether or not it can be transported.—*Pittsburg Dispatch.*

AMERICAN GENIUS.—It is one of the most marked characteristics of American skill and genius that whenever any new industry is started in this country, which materially depends upon the use of machinery for its successful competition with other localities, the desired success is largely brought about by improved devices for its prosecution. Until within a few years it was thought impossible to compete with European countries in the manufacture of plate glass. The business, however, was started and is now firmly established. To show how this has been accomplished, it need only be stated that the German polishing machine formerly in use was bought at a cost of $10,000. Within the past six months American mechanics have constructed a new polishing machine whose cost will not exceed $2700, and thus early in the trial it has demonstrated its superiority over its foreign predecessor by doing the same work regardless of area, in two hours less time, and giving a better finish to its product.

PROPULSION OF BOATS BY ELECTRICITY is effectually exhibited at the Edinburgh Exhibition. On the Union canal, which skirts one side of the exhibition site, four launches, each 40 feet long, 6 5 feet wide, drawing two feet of water and carrying 40 persons, are run by storage batteries. The machinery has been supplied by M. Immisch & Co., of London. The charging plant consists of an Immisch dynamo and a 25 b. p. engine, all the launches being charged at the same time, usually at night. A launch can run 10 to 15 hours on a single charge. Details as to weight of storage batteries and time taken for charging are lacking.

THE HALPIN SAVAGE TORPEDO, lately inspected by the Board of Naval Engineers, carries its own motive power in the shape of storage batteries, and only a very light wire cable is paid out, by which the operator on shore controls the steering gear. The torpedo proper has an independent means of propulsion by rocket composition which can be fired electrically. The mechanism is so arranged that when a net is hit the torpedo is disengaged, dives underneath the net, comes up and is exploded when close to the hull.

SCIENTIFIC PROGRESS.

Can Science Control the Elements?

The frequent occurrence of cyclones, tornadoes, cloudbursts and other exhibitions of elemental fury, accompanied often by appalling destruction of life and property, forces increased attention by thoughtful men to the question whether science is and must always remain powerless to guard against such dangers. Man has already successfully grappled with many foes to human health and safety, encountered in various forms of disease, in the pursuit of ordinary vocations and in connection with the means of transportation. But the cyclone which comes without warning from the sky, scattering sudden death and destruction along its path and as suddenly disappearing, leaving a blue sky over the misery which the storm spirit has created, seems naturally to be a demonstration of omnipotent power which human art must be powerless to control or mitigate.

Yet science in these later days sees no boundaries to the possibilities of its power, and in view of the astonishing discoveries and achievements which the mind of man has already been permitted to make, it does not require audacity or the exercise of extravagant faith to believe that eventually man will find that to no small degree he has power also over the elements in their most dangerous manifestations.

Not many years ago, man said that they were utterly powerless to protect themselves against the thunderbolt which leaped from the sky, carrying fire and death to the earth. But Franklin devised the lightning rod, which now conveys the fire shaft to the ground without injury to man or his possessions. Many at first believed it to be an impious thing to attempt thus to interfere with the messengers of the Almighty, and the Roman Catholic church denounced the lightning rod as an invention of the enemy of mankind. But in these days men believe that any comfort or protection which human genius is permitted to discover for the benefit of mankind is not only proper but to be received with thankfulness, and the suggestion of attempting to diminish the dangers from violence of the elements is no longer looked upon as impious, nor, in view of what science has already achieved is it safe to pronounce any scientific undertaking impossible or preposterous.

These remarks are suggested by the following communication which we have received from a civil engineer of extended experience whose name is familiar as the chief engineer of one of the southwestern railways:

Generally speaking there are few evils which cannot be overcome or whose effects cannot be somewhat ameliorated by some device of man, and I am constrained to ask through your paper for some suggestion as to the probable best cure for the evil effects of what is generally termed a cyclone. As the west becomes more densely populated, the loss of life will increase as a result of our twisting storms, and may it not be advisable to intercept nature and bore a hole artificially and continuously through the air to cooler regions aloft rather than to allow nature to suddenly and violently try to seek an equilibrium in the atmosphere? Plainly, could out steel stand pipes, say 500 feet in hight, be distributed in the most thickly inhabited localities, with powerful fans either run by water or otherwise, which would do during the dangerous period continuously what nature does violently and suddenly?

There is another subject which interests the west—the rainfall. Gen. Ruggles, an officer of the U. S. army, suggested and tried to get the State of Texas to appropriate a sum to be used in experimenting with balloons, freighted with some explosive, which at a certain hight by a system of clockwork would be exploded and tend to mingle two currents of air, and if they happened one to be cold and the other to be warm and charged with moisture, he thought the moisture would be precipitated on the land. The legislators did not think the general's ideas were sensible, or possibly they may have been deterred by the consideration of additional laws to be enacted to protect the brick-maker against the hungry farmer.

Our correspondent's suggestion is submitted for consideration. While it may not indicate a practical method of dealing with cyclones it may serve to direct the attention of scientific men still more earnestly to the subject and evolve results which shall bless mankind. If the lightning rod draws the electric fluid harmlessly from sky to earth why may not a similar principle be applied to providing escape-ways for the concentrated violence of the air from earth upward? The other suggestion, concerning the production of rain, is directly in accordance with scientific principles already developed beyond the region of theory, but for which more definite means of practical application are still to be desired.—*Railway Age.*

IS THERE MORE THAN ONE ELEMENTARY SUBSTANCE? — Analogy forbids us to believe that down to a certain limit of dimensions that we call molecules, the constitution of matter is of a wholly different sort from that which appears on subdividing the molecules. It is an equally incredible assumption that all atoms of the same element are so many independent creations, exactly alike in every respect. Then, as our knowledge increases, the distinctions between the chemical elements are becoming less marked and their relations to each other more intimate. They are beginning to appear not as isolated units, but as links in a complex network, which presents an unbroken continuity throughout. The recent study of the rarer earths leaves us in doubt whether we have an indefinite number of elements, or only one under innumbered manifestations; and the later results of spectrum analysis seem to indicate quite clearly that at the high temperatures of the sun and the fixed stars, many of our terrestrial elements are decomposed. From a mathematical analysis of the spectra, Grunwald maintains—and supports his conclusion by a remarkable array of confirmatory measurements—that the remarkable solar spectrum line called helium, and the equally well-marked line of the sun's corona, come from two constituents of hydrogen gas, the first of which is somewhat heavier and the last far lighter than hydrogen gas.—*Manufacturer and Builder.*

Seeing by Electricity.

It is said that modern electricians may succeed in constructing a device that will do for the sense of sight what the telephone does for the sense of hearing; but the prospects of such an achievement are not particularly bright. The possibility has been demonstrated experimentally, but the practical difficulties in the way of carrying out the idea are very great.

It is well known that certain salts of copper and silver, for example, generate electric currents when exposed to the light, and, conversely, electric currents will produce in these salts changes corresponding to those made by light. If a strongly illuminated object is placed in front of a transmitter covered with such a salt, electrical currents will be generated which will vary in intensity according to the intensity of the light falling on different parts of the surface. If now, these various currents were carried to a receiver similar to the transmitter, they would produce on its surface changes like those wrought by light on the surface of the transmitter.

Another apparatus has been proposed, based upon the property peculiar to selenium that its electrical resistance changes with the intensity of light. For a transmitter the selenium cells are arranged in square, like a checker-board. The greater the number the more efficient would the apparatus be. Each of these is connected with an electro-magnet in the receiver. The latter is composed of a mirror constructed of thin strips of steel, to each of which several of the electro-magnets are attached. A strongly illuminated body being placed in front of the selenium transmitter, the electrical resistance of the various cells varies according to the intensity of the light, as in the case of the salts of copper and silver. The various currents affect the electro-magnets in different degrees, the result being that the strips of steel are bent irregularly, turning the mirror into an aggregation of surfaces, very slightly warped, which will throw an image on a screen.

The main difficulty in the way of the realization of such an idea as seeing by electricity lies in the necessary complexity of an apparatus which shall enable innumerable points in the transmitters and receivers to be actuated simultaneously in perfect independence and also in perfect correspondence; but it is quite possible that further experiment will bring into actual use what might be something more than a mere plaything. In defensive warfare a telescope of indefinite length would certainly be of value. With buried wires and concealed visors a general might watch his adversary's movements at times when this would mean victory instead of defeat.—*Electrical World.*

LANGUAGE OF FISH.—Mr. W. A. Carter, in a recent lecture on "Marine and Fresh-Water Fishes," said that fish have the power of influencing one another by sounds and action. He had observed a shoal of carp following the lead of a single one, which conducted them to a quantity of food at a considerable distance away. He had also noticed that certain fresh-water fish, such as trout, were subservient to a ruler, who might be seen swimming at the head of his tribe. The same was possibly the case with some marine forms, like the herring and bass.

THE EIFFEL TOWER.—The London tower designs, for which prizes were offered, have all come in and been examined. The first prize of 500 guineas has been awarded, also the second of 250 guineas, and a third has been given special mention; but all three of these designs, and still more the 60 or 80 of others, were so far inferior to the Eiffel tower in dignity and grace as to make it ridiculous to prefer them to a mere enlargement of the latter. This the committee in effect states, recommending no plan for construction.

ELECTRIC-LIGHT BUGS.—When the first Atlantic cable was laid scientists asserted that an insect would soon appear which would attempt to destroy it; and sure enough in a short time an insect, not classified by entomologists, began its work on the insulators. The electric-lighting system in large cities seems also to have developed a similar condition of things in the shape of what are called electric-light bugs; and singularly, each system of lighting has its own peculiar insect satellite.

BIRDS ON THE PERCH.—The reason given why birds do not fall from their perch is because they cannot open the foot when the leg is bent. Look at a hen walking and see it close the toes as it lifts its foot and open them as it touches the ground.

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[NEW THIS ISSUE.]

Pulverizer and Concentrator—S. K. Snodgrass.
Partnership Notice—Connor & Graot.
Dividend Notice—Pacific Borax, Salt and Soda Co.
Millwrights and Engineers—Connor & Grant.
See Advertising Columns.

Passing Events.

Silver reached a higher point in New York this week than it has for five years. Moreover, large quantities are going to London at present, reversing the predictions of the anti-silver men, who said silver would flow to this country from abroad if the silver bill passed.

If the statements of a Redding paper prove true, as reported in our mining summary in another column, Shasta county will be greatly benefited. A rich English company is reported as proposing the purchase of a number of mines and the erection of tramways and an immense mill plant on the Sacramento river. English capital has already been invested in Shasta county mining property to some extent.

There are no new features to report concerning the molders' strike in this city, which has lasted so many weeks. Several more Eastern molders have arrived and gone to work in the local shops. Some, also, have left; but the shops are all running their foundry departments, though with more or less inconvenience.

THE formation is nearly all clay above the gravel in the artesian well at Battle Mountain, where gold was found at a depth of 640 feet below the surface. It is probable that a shaft will be sunk to bedrock to get the gold-bearing gravel out by drifting.

The Comstock Mines.

From the Comstock mines, advices received Wednesday report that the ore in the Ophir winze was widening and improving. The winze in Savage was also improving, as was the Potosi winze, which, it is said, has been turned so as to run into ore. The southwest drift on the 600-foot level in Alpha, when in about 95 feet, cut the east wall of the ledge. In Con. Virginia advices are of an improvement on the 1600-foot level in the mine. On the 630-foot level in Sierra Nevada they were in ore. In Overman the management is not taking out the good ore, but instead are milling ore going below $20. This, it is said, is done so as to break the stock to about $2 a share. Whether this latter report is correct or not, time can only tell. As far as that is concerned, there are reports of slightly lower prices on all the Gold Hill stocks before they will be a buy for something good. In Yellow Jacket, on the 500-foot level, they passed through six feet of ore which will mill $40 a ton, after which an old winze was run into. In Kentuck they are drifting east and west on the 1000-foot level, and at the same time prospecting on an upper level. The official letter from Savage gives the battery assays $4 higher, while Crown Point's is $3 lower and Belcher's $5 lower. Active prospecting work is being done in all the Gold Hill and middle mines.

As far as that is concerned, there is more work, and that, too, of an important character, being done in the Comstock mines than for many years, and if the mines were differently managed there might be a possibility of a genuine mining-stock boom. From Hale and Norcross to Overman there are mines that would be paying dividends if they were conducted on business principles and managed strictly in the interest of stockholders.

Following is a statement of the total ore and bullion yield of the Comstock lode mines during the quarter ended June 30, 1890, compiled from the sworn statements of Superintendents now on file in the office of the County Assessor, Storey county, Nevada:

	Tons.	Bullion.
Con. Cal. and Virginia	35,485	$ 512 879 27
Savage	6,186	90,912 01
Hale & Norcross	13,233	85,749 81
Con. Imperial	212	3,217 60
Overman	4,233	75,943 22
Crown Point	9,960	137,362 35
Justice	2,333	54,104 59
Alta	4,200	40,148 33
Challar	5,881	97,914 94
Yellow Jacket	7,500	105,000 00
Totals	88,993	$1,300,013 62

The above are all official statements except that of the Yellow Jacket, which has not yet been filed. The total exceeds that of the first quarter of the current year nearly $415,000. The next quarterly statements will include the Belcher and Ophir, which have been added to the bullion-producing mines of the lode the current month. The total bullion tax on the above yield is $2448.12, with the probability that the Yellow Jacket report may swell it to $3000.

Cable-Patent Infringement.

A decision of interest to the people of this coast comes to us from the U. S. Circuit Court, Northern District of Iowa, Western Division.

Many of us remember the beginning of cable roads, and it is our boast that San Francisco was not only the pioneer, but that it still leads the world in this most useful class of street railways.

To us, the name of A. S. Hallidie is indissolubly connected with the inception and progress of this system. His early inventions in this line were numerous and have been generally adopted. That one commonly known as the "slot switch," and covered by letters patent of the U. S., No. 179,016, dated June 20, 1876, was adopted and used by the Sioux City Cable Railway Company, without the license of its present owner, the National Cable Railway Company of New York, the assignee, east of the Rocky mountains, of that and many other cable-road patents of Mr. Hallidie and his associates (the Pacific Cable Railway Company of San Francisco being the Western assignee).

Upon a bill in equity, filed to restrain this infringement, Judge Shiras, in a well-considered opinion, has recently decided in favor of the National Cable Railway Company, sustaining the patent and holding an infringement on the part of the Sioux City Cable Railway Company,

Mine Management in Nevada.

In the editorial department of the New York *Engineering and Mining Journal*, under date of June 28th and July 12th, will be found a severe commentary upon the managers and their management of the Comstock mines. And the *Journal* compliments us by saying: "We are glad to note that the San Francisco MINING AND SCIENTIFIC PRESS is keeping up the agitation—not that we have a very hopeful expectation of any great practical gain to attain by it, for Comstock peculiarities are too deeply rooted to be overturned by denunciation, or, as it seems, by law. But purely as a matter of principle, it is well to protest, even if ineffectually."

Do these words, quoted from one of the editorials mentioned, convey to the ordinary reader why so many of our Pacific Coast mines fail to draw capital from Eastern capitalists? Is it true that our laws cannot be enforced against the very few men who manage these mines, and in behalf of the thousands upon thousands of stockholders who own jointly therein? We sincerely hope it is not true. Still it is evident that the General Government should take this matter in hand and make a thorough investigation of the charges preferred and now in the hands of the Government officials. These charges should be investigated in order to remove the stain upon our mining industries. If the charges are false, let the parties bringing them suffer; if they prove true, let the Government do its duty by a body of its citizens who claim to be oppressed by severely punishing the oppressors.

"An investigation has been made," said the President of the Mining Stock Association in a recent interview had with that gentleman, "and it revealed a strange state of affairs. Our association, consisting of stockholders in mines, have been struggling with the courts, aided by brief notices from the press, for the past year to get some representation for stockholders in the distribution of the profits of the mines in which they own. Our association does not object so much to the $7.00 per ton paid for milling as it does to having at least 50 per cent of the value of their ores run off in tailings and slime by the mill companies.

"We think the mill company can mill ores at $3 00 per ton and make a profit; but our objections have been put in writing, and not only filed with the mining companies who are robbing us, but we have preferred charges against their using the U. S. Mint at Carson in connection with the bullion which they take from the ores and fail to return to the mines. The bullion belongs to the mines. All bullion taken from ores of the mines and not returned to them by the mill companies has been stolen; and we are preparing to recover that which has been stolen. Take the Hale and Norcross and Savage mines for example. At the annual election of the Savage mine, one year ago, we filed a protest against the mill steal, and made a demand, at that time, for the Directors to commence action for a recovery of the bullion taken from the companies' ores and not returned to the company. They have had one year to make up their minds. Soon we will show them what we are trying to do. In that protest—a copy of which we have on file—you will see that we use their own figures to prove that formerly the mills were required to return 65 per cent of the mine assay, and by their figures we also prove that the mill company returned 35 per cent only, thus reversing the order of things, and retaining that portion which they formerly were obliged to return.

"There are figures on their bullion record books in Virginia City showing that 70 per cent of the mine assay has been used as a base of settling with mills. Our association made a further demand of the Savage Company at that time. They demanded that the directors order the superintendent to report his mine assay, weekly, to the San Francisco office, and by so doing obey the laws of our State. They have refused to comply with the demand, and have stood off an action in the courts, by delays, which was instituted to compel them to give all stockholders the knowledge which they selfishly and illegally withheld. In refusing to obey the law, although their superintendent has testified under oath that he makes the mine assays daily and is willing to send them to the office when so ordered, it shows the contempt they have for our laws, and the boldness with which they confiscate the rights and property of stockholders.

"To further illustrate our object, take the Hale & Norcross reports for the first few months of 1889. In February they milled 3973 880 2000 tons. The mine assay of the ore which the stockholders were not allowed to see, is claimed to be about $56 per ton. When the mill company had put it through their new process, it assayed about $22 75 per ton, and the mill company returned to the mine $19 65 per ton. Here is an example of how $50 ore is made to pay less than $20 per ton. You may ask how it is done and we can only explain the discrepancy by calling your attention to the slimes and tailings. In the first place, it does not seem to matter how rich the ore is when it comes from the mine. You will find that the mill company report their assays somewhere around $20 per ton. That seems to be an understood figure. Out of such ore, ranging from $20 to $25 per ton, we have assays taken from the tailings of about $9 per ton; and assays of slimes, taken from the sluice-boxes leading to the slime ponds, that will go over $100 per ton.

"We think such evidence sufficient explanation of how owners of mills get very rich at the expense of stockholders in mines. Against such action we are patiently awaiting the action of our General Government in regard to charges preferred by our association; an action we have in the Superior Court to compel them to furnish the stockholders of mines with the true assay of their ores, and a general complaint we propose to compile for an accounting of all bullion taken from the ore of the mines. It must be apparent to any business man that these mill companies have been doubly compensated for crushing the ores of the mines when they are paid $7 per ton. The bullion coming from those ores is the property of the mines. Every ounce withheld from the mines and illegally appropriated by parties other than mine-owners, will have to be accounted for by the mill companies and those people who have acted as trustees for all stockholders.

"We do not think half of the men acting as trustees in mines, fully realized the grave responsibility they have taken upon themselves when they turn property, held in trust for all stockholders, over to mill companies to be looted. Somebody will have to respond when the day of accounting comes; and that day always comes, be it sooner or later."

Ancient Lake Cliffs and Terraces.

The facility and certainty with which the vestiges of ancient water margins are recognized and traced depend on local conditions. The small waves engendered in ponds and sheltered estuaries are far less efficient in the carving of cliffs and the construction of embankments than are the large waves of larger water bodies. The element of time, too, is an important factor. A system of shore topography from which the parent lake has receded is immediately exposed to the obliterating influence of land erosion and gradually loses its character and definition.

The wave-built terrace is distinct from the wave-cut terrace in that it is a work of construction, being composed entirely of shore drift, while the wave-cut terrace is the result of excavation and consists of the pre-existent terrane of the locality. The wave-cut terrace is overlooked by a cliff rising from its upper margin, and only appears on the margin of an open basin broad enough for the propagation of efficient waves.

The great Lake Bonneville (of the Quaternary period), in the division of the Great Basin of Utah, is known by the records on its ancient shore-lines. All about the Great Basin of Utah the lower slopes of the mountains are skirted by level tracings—not a single line merely at a single level, as in the Coast Range of California, but a series of lines at many levels, testifying to a system of oscillation of an ancient lake. The highest water-line is 1000 feet above the level of the Great Salt Lake, and over every foot of the intervening profile can be traced evidence of the action of waves. The point of outlet of this ancient lake was at the northern extremity of Cache valley. The sill over which the water at first discharged was soft, and yielded easily to the wear of running water, permitting the lake level to be rapidly lowered, but eventually a reef of limestone was reached, by which the erosion was checked and held at a nearly constant level until the outflow was finally stopped by climatic changes which diminished the water supply.

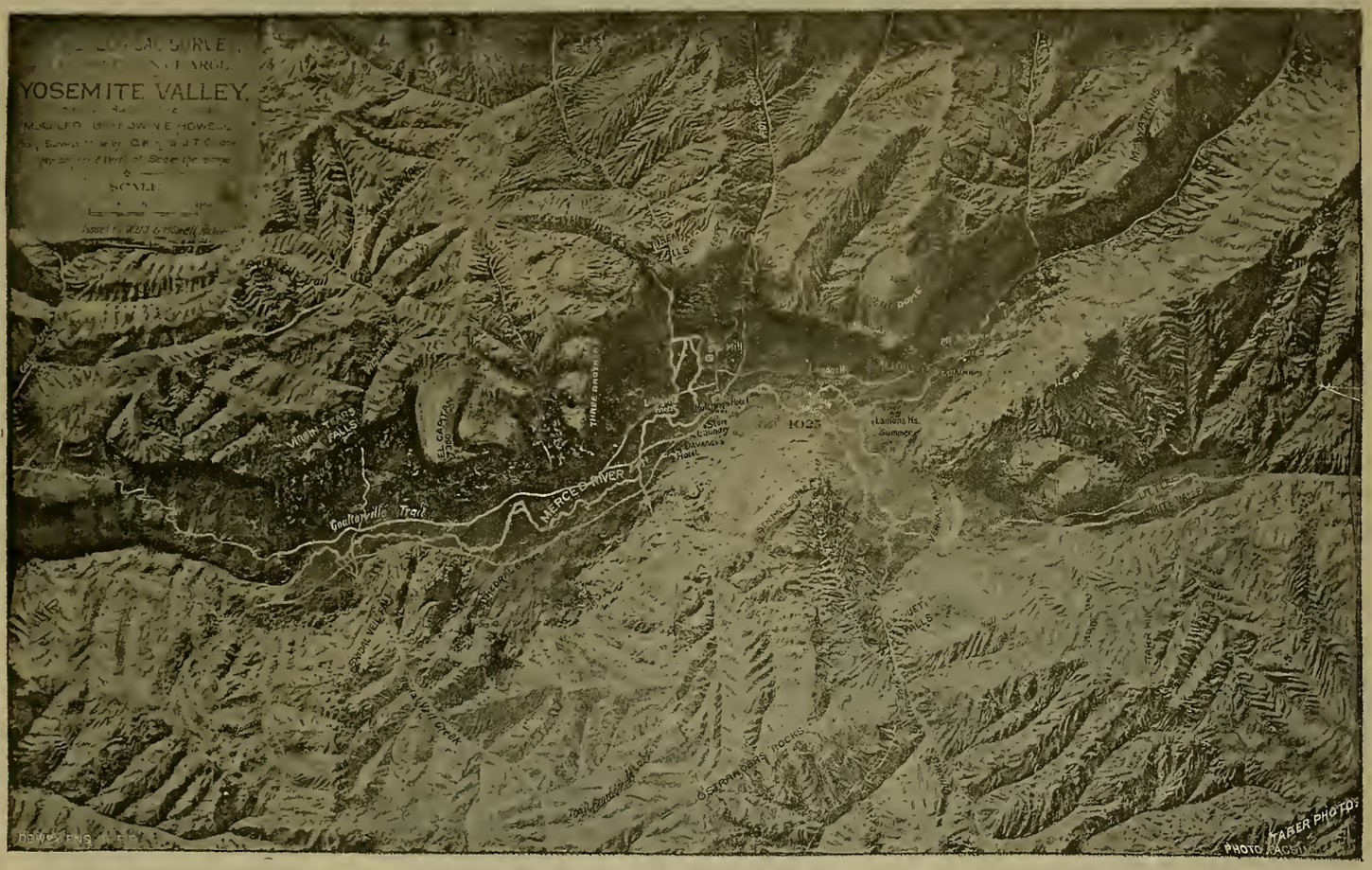
The history of this great lake is written by wave-sculptured topography and by lacustrine deposits. The Bonneville basin is surrounded by and interspersed with mountains. Form and substance conspire to prove that the lake had a beginning as well as an end, and before its inception the lake basin was for a long time subjected to the ordinary laws of sculpture by the action of rain. Nevertheless, the Bonneville shores are almost unmodified.

On the first page of this number of the PRESS is reproduced a view of a portion of the shores, showing the sea-cliffs and terraces carved by the waves of Lake Bonneville, on the north end of the Oquirrh range, Utah. This is only one of the many evidences of the existence of this great Quaternary lake.

A Bird's-eye View of the Yosemite.

The Yosemite season is at its hight and the valley is receiving its annual throng of visitors from all quarters of the world. To those who have visited the valley and to those who contemplate pilgrimages thither the relief map which we present on this page will be welcome. So far as we know it is the first presentation in a newspaper of this unrivaled method of portraying this grandest feature of California topography. We reproduce the engraving from original sources by the photo-facsimile process of the Dewey Engraving Co. To one who studies closely the picture new excellencies continually appear. Like all relief maps it gives impressions and knowledge of conditions which are, by the nature of the case, wholly lost in a flat map, and it conveys a knowledge of the collocation of the features of the country which cannot be learned by series of isolated views no matter how excellent they may be. In fact it supplements admirably the impressions gained by personal inspection of the valley, for no one can obtain a point of view which will yield a knowledge of the topography such as the topographers have patiently created by their methods of almost countless measurements. The sources of information employed in the representation and the persons engaged in the honorable work are stated in the upper left hand corner of the picture.

The student of the valley will gain from this map both actual knowledge of facts and impressions of the grandeur of nature's handiwork. It discloses the general trend of the main valleys and its tributary gorges. It shows the water-courses, the trails to reach notable points, and the manner in which the visitor gains giddy hights by practicable routes. It gives also the elevation of the most noted points, and by implication as well as by the shadows the depth of the depressions below them. It will prove of permanent value to all acquainted with the valley as a skeleton around which they can place the firm flesh of their experiences and adorn with the garments of their imagination.



RELIEF MAP OF THE YOSEMITE VALLEY AND ADJACENT COUNTRY.

THERE are probably 30,000 tons of tailings, accumulated at the Morgan mill, up on the Comstock, that will be run through the pans after the stamps are hung up.

SINCE the Humboldt Reduction Works started up in the latter part of May on ore from the Winnemucca mine, 14 bars of bullion, weighing from 80 to 100 pounds each, have been shipped.

Cable Railway Anniversary.

Seventeen years ago yesterday (Aug. 1, 1873,) the trial trip of the first cable railway was made at 4 o'clock in the morning on Clay street in this city.

The road as originally constructed ran from Kearny to Leavenworth street, and after making this trial trip and one in the afternoon of same day, both of which were successful and satisfactory, the road was stopped for a month to extend the tube one block farther, and it began running again permanently on the first day of September, 1873.

The terms of the franchise required the road to be in operation by the 1st of August, hence the necessity of making the trial trip on that day.

The plan had been criticised, and no confidence was expressed by those competent to judge of the enterprise. The inventor, Mr. A. S. Hallidie, after two years' effort had despaired of having the system tried, until Messrs. Joseph Britton, Henry L. Davis and James Moffit came forward and joined him in the cost of its construction. On the first trip, on a foggy morning in August, the man detailed to engineer the dummy, when all was ready at top of the hill to make a start, weakened, and Mr. Hallidie took the grip and made the trip down and up. He is thus the oldest gripman in the country.

It was three and a half years after this that the next cable road was built, which was on Sutter street, followed in some course of time by California, Geary, Union and Market streets. The Omnibus Cable Co. is the last cable road built in this city and it is interesting to note that it was that road which first determined Mr. Hallidie to improve the street railroad system.

Running up Jackson street between Montgomery and Stockton, extra horses had to be used to haul the cars of the Omnibus Company up that steep street, and the horses in struggling up the hill with heavily loaded cars, in the winter, often fell and were dragged down the hill; the brakes not being able to hold the car. Humanity for the horses prompted Mr. Hallidie to find a better way, resulting in the Cable Railway System.

Silver Shipments.

The predictions of the anti-silver men have not only not been verified, but have been completely reversed, since large quantities are being shipped to London instead of flowing into this country. Over a million and a quarter ounces went last week and as much more this week. A month or so before the passage of the Silver bill London sent a million and a half ounces to this country because they thought the bill would not pass. Now the flow has set the other way.

On August 13th the Government will begin to buy 4,500,000 ounces of silver monthly for which certificates will be issued and the bullion stored. This demand will be met by the silver owners and mines that have not paid will again become profitable since the discount on the metal is so much reduced. Moreover, England wants silver just now to send to India in payment for wheat and cotton and makes an earlier demand than usual because of the action of this Government on the silver question.

The men who own the mines in the silver-producing States can now realize something from their investments. For some years the price of silver has been depreciated and great loss has occurred owing to the heavy discount. Now, however, that the price has advanced so materially, with probability of a still further increase, this discount naturally lessens sufficiently to admit of profit on ores heretofore unworkable. This ought to, and doubtless will, start up many low-grade mines which have been lying idle during the depressed condition of the white metal. Districts and camps which have been struggling for existence should once more flourish and give employment to many more miners.

ANOTHER RIVER BED ENTERPRISE.—A special from Oroville, Butte county, says: Parties in this community who held interests in the Cape Union and Cape Creek mining claim, comprising a mile and a half of the Feather river channel, at Oroville, were paid off in gold coin at the bank of Rideout, Smith & Co. to-day by Major Frank McLaughlin. Many old miners who never expected to realize a dollar were made happy with snug fortunes. This is the result of the Golden Feather, which was successfully floated in London, England, May 15th. Work will be commenced on the great mine and numerous other enterprises started, which will tend to build up the town and revolutionize mining. The company represents a capital of $180,000, all paid in.

Causes and Cure of Hard Times.

In seeking to get at the causes of "hard times," we find one that lies far deeper down, far nearer the heart of the matter than any question about free silver coinage, or the tariff, or loaning money on mortgages. These are indeed matters of equity, expediency and (so to speak) convenience; but deeper down lies the fact that the producers and actual manufacturers and *honest* carriers and commission merchants—deeper down, we say, lies the fact that those who honestly do needed work and are content with a fair share of what the world's work produces, are but part (alas that they are so small a part!) of those who enjoy the *products* of such useful industries. However ingenious the plans devised for making money plenty, the honest toilers will still be robbed of their due, so long as wolves, foxes, and locohes are propagated. The deeper cause of hard times is the prevalence of that spirit which breeds parasites and robbers, which allows young men and maidens to grow up with no manly nor womanly longing and resolve to be of use in the world; to grow up concerned only to get all they can—their own share and the shares of others, too, if possible—with no sense of the truth that if "the world owes them a living," it is only as they each one owe the world life-service.

THE Sierra Valley *Leader* says: C. B. Stanley, who came to this State in 1840, is prospecting in this and Plumas county. When he came here there were only 16 Americans and 26 English known to be on the coast. He is 69 years old, hale and hearty. He was at Monterey when Captain Jones hoisted the first American flag, in 1842.

A FIRE at Wallace, Idaho, this week, destroyed the business portion of the town and entailed a loss of half a million dollars.

NEVADA'S POTATO CROP is reported to be uncommonly large this year.

WOMEN CARPENTERS have appeared in London.

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ENGINES, BOILERS, STEAM PUMPS,
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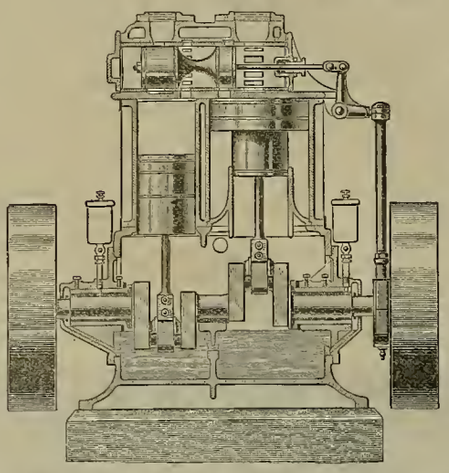
GOLDEN GATE CONCENTRATORS,
GREATEST CAPACITY OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps.



SAW MILLS, MACHINE TOOLS,
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FIRE EXTINGUISHERS,
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GENERAL AGENTS FOR

WESTINGHOUSE AUTOMATIC ENGINES.

SALES DURING LAST FOUR MONTHS:

COMPOUND, 44 ENGINES, 5215 HORSE POWER. STANDARD, 99 ENGINES, 4500 HORSE POWER. JUNIOR, 166 ENGINES, 4260 HORSE POWER.

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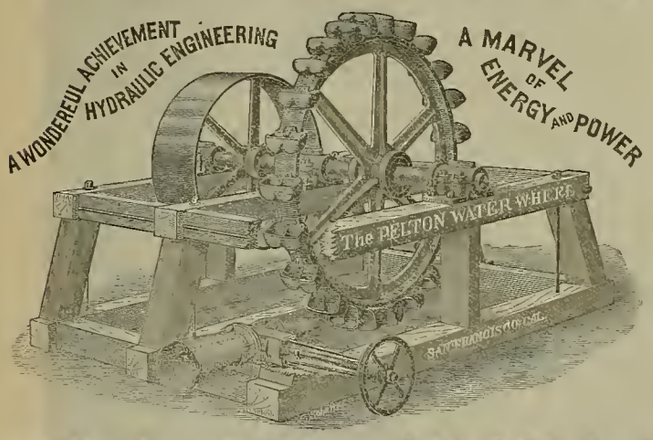
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A MARVEL OF ENERGY AND POWER
The PELTON WATER WHEEL Co.
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OVER 800 ALREADY IN USE.

Affords the Most Simple and Reliable Power for all Mining and Manufacturing Machinery.
Adapted to heads running from 20 up to 2,000 feet.
From 12 to 20 per cent better results guaranteed than can be produced from any other Wheel in the Country.

ELECTRIC TRANSMISSION.

Power from these Wheels can be transmitted long distances with small loss, and is now extensively used in all parts of the country for generating both power and light.

APPLICATIONS

Should state amount, and head of water, power required, and for what purpose; with approximate length of pipe; also, whether the application is with reference to *Wheels* or *Motors* described below. SEND FOR CIRCULARS.

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PELTON WATER MOTORS.

Varying from the fraction of 1 up to 15 and 20-horse power. Unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. ☞ SEND FOR MOTOR CIRCULAR. ADDRESS AS ABOVE. ☜

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AT REDUCED PRICES.

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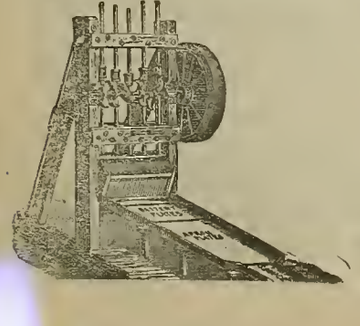

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Only Refined Silver and Best Copper used. Over 3000 Orders filled. Fifteen Medals Awarded. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated.

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Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

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CONCENTRATING MACHINERY.

Blake, Oodge and Comet Crushers, Cornish Crushing and Finishing Rolls, Hartz Plunger and Collom Jigs. Frue Vanner & Embrey Concentrators, Evans', Calumet, Collom's and Rittenger's Slime Tables. Trommels, Wire Cloth and Punched Plates. Ore Sample Grinders and Heberle Mills.

IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❋ BOILERS HORIZONTAL, VERTICAL AND SECTIONAL.

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Ore Cars, Water & Ore Buckets,

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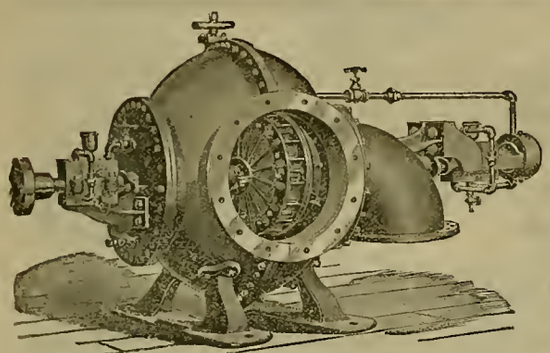
HELENA, MONTANA, Room 28, Merchants' National Bank Building, No. North Main St.

SOLE WESTERN AGENTS FOR TYLER WIRE WORKS DOUBLE CRIMPED MINING CLOTHS.



JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted to capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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Assaying of Ores, $25; Bullion and Chlorination Assay, $25; Blowpipe Assay, $10. Full course of assaying, $50.

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JOHN T. EVANS, M. A., Principal.

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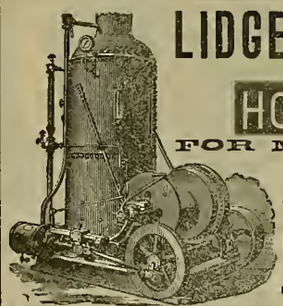
Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential.*



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FOR MINING PURPOSES.

300 Styles and Sizes. Over 6500 in Use.

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CORD"

SQUARE FLAX PACKING,

Manufactured from strictly first-class Flax and pure lubricants. Superior to all others for water and steam. Packs with less friction and makes a tighter joint than any other packing made. ☞ Imitations of inferior quality having been put upon the market, we have been compelled to adopt the above trade-mark, and all of our packing will now have a RED CORD running through the center its entire length. See that you get it and take no other. Sold by all Hardware dealers. Price, 50 cents per pound. W. T. Y. SCHENCK, Sole Manufacturer, 222 and 224 Market Street, San Francisco, Cal.

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Assay Office, Chemical Laboratory,

BULLION ROOMS and ORE FLOORS,

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COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.

WORKING TESTS OF ORES BY ALL PROCESSES.

SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

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GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

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Standard Shot-Gun Cartridges,

Under Chamberlin Patent.

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ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

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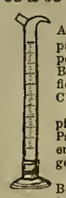

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

M.C.Co BATTERSEA

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents for the Morgan Crucible Co., Battersea, England. Also for E. G. Dennistoun's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,

Near First and Market Streets, S. F.

C. A. LUCKHARDT, Manager. ESTABLISHED 1869.

Ores worked by any Process.

Ores Sampled.

Assaying in all its Branches.

Analyses of Ores, Minerals, Waters, etc.

Working Tests (practical) Made.

Plans and Specifications furnished for the most suitable Process for Working Ores.

Special attention paid to Examinations of Mines; Plans and Reports furnished.

C. A. LUCKHARDT & CO.,

(Formerly Huhn & Luckhardt,

Mining Engineers and Metallurgists

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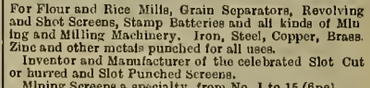
BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.



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For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

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Orders promptly attended to.

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Laundry Free for the use of Families.

HOT AND COLD BATHS FREE.

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And Upward.

Rooms with or without Board.

Free Coach to the House

J. POOLEY.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, July 31, 1890.

General trade the past week shows a slight increase in the volume of goods going out. The call is setting in from the most remote points, which will be soon followed by near-by distributive places.

Among manufacturers there is nothing new to report. The advance in silver, it is claimed, will be followed at an early day by free orders for mining machinery, for quite a boom in both gold and silver mining is setting in.

The local money market is fairly easy. This, no doubt, is largely due to more confidence felt in the future, and also to the fact that the Government has a large surplus (over $100,000,000), the most of which is to be disbursed in payment of bonds.

MEXICAN DOLLARS—The appreciation in silver has caused freer buying by the Chinese. The market has held strong at 87½@88 cts., with some bolders asking 90 cts.

SILVER — The English and New York markets have gravitated to higher figures, closing to-day (Thursday) at 50⅛d. in London, and $1.10⅛ in New York. In our market the latest sale reported was at $1.09⅝ to a local bank. The Mint has been out of the market for over a week, waiting instructions from Washington. The prevailing opinion is that the price of silver under the new law will be advanced to much higher figures, probably $1.15 and over. Journalistic writers at the East who opposed the position of the MINING AND SCIENTIFIC PRESS on the silver question, now find that events of the past month have verified every statement made by us. Silver does not flow into this country but it is going out at a faster rate than noted for several years past. Our latest European advices warrant the asserlion that the Latin Union is likely to open their mints to the free coinage of silver. But then this may possibly be deferred until the United States Congress passes an Act opening our mints free to silver coinage. Bimetalism is gaining ground in the gold standard countries abroad.

QUICKSILVER—Receipts the past week aggregated 133 flasks. The market is easy at a decline. Exports by sea the past week aggregate 20 flasks to Auckland and 105 flasks to Guaymas.

LIME—Receipts the past week fell off to 297r bbls. The exports by sea aggregate 350 bbls. The market is essentially unchanged. The demand is only fair.

BORAX—Receipts the past week aggregate 1300 ctls. The market is easy, with slight concessions reported obtainable.

CHROME ORE—Shipments to New York show a slight increase. Last week there was shipped by sea 305 690 lbs. to New York.

LEAD—The market does not present any new features deserving of particular mention.

COPPER—Exports by sea the past week aggregate 52 000 matte to New York. The market is exceedingly firm. *Iron Age* reports the New York market on July 24th as follows: The position of the market continues strong and prices are still slowly, but steadily, moving upward. Purchases of 400,000 to 500,000 pounds early in the week under review cleaned up all the Lake Superior that could be obtained at 17c. That price has since been offered and refused for various quantities up to 1,000,000 pounds.

A London cable of July 23d says: Copper has ruled somewhat irregular in price, receding to £57 spot for Merchant bars, and upon purchases of large blocks at that figure subsequently moved up to £57 15s. Speculative holders, fearing a further decline, have realized freely, but the position continues strong.

IRON—Imports the past week aggregate 40 tons from England and 25 tons from New York. The market continues to exhibit a strong tone at full prices. The consumption with us promises to enlarge. Eastern mail advices are favorable to a better market. English cable advices up to July 23d report a strong and advancing market.

COKE—Imports the past week aggregate 662 tons from England. The local market is reported barely steady under free supplies.

COAL—Imports the past week aggregate as follows: Nanaimo, 7516 tons; Port Moody, 1350; Coos Bay, 1150; Seattle, 5000; Tacoma, 5250; Swansea, 1666; Newcastle, N. S. W. 2639. Total, 25,371 tons. The market for all positions is reported strong. Perhaps the only exception that can be taken from this statement is that of late shipments from Australia. The demand with us is quite free, but the supply is ample, but with winter coming on is not in excess of requirements.

Our Agents,

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none out worthy men.

J. C. HOAG—San Francisco.
SAMUEL CLIFF—San Luis Obispo Co.
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W. W. THOBALDS—Ventura and Los Angeles Cos.
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W. S. FROST—Alameda and Contra Costa Cos.
J. G. H. LAMPADIUS—Santa Cruz Co.
GEO. WILSON—Sacramento Co.
H. KELLEY—Modoc and Lassen Cos.
T. M. STACKUS—Sierra Co.
J. W. PURDY—Tuolumne Co.
WM. M. HILLEARY—Oregon.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.
ELMER R. JENKINS—Oregon.
R. G. BAILEY—Washington.

Eastern Metal Markets.

By Telegraph.

NEW YORK, July 30.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	50	1 00½	$17 50	$4 60	$20 30
Friday	49⅞	1 00½	17 60	4 45	20 00
Saturday	49⅞	1 00⅝	17 60	4 45	20 35
Monday	50	1 00⅝	17 60	4 42½	20 90
Tuesday	50⅛	1 00⅞	17 60	4 40	20 85
Wednesday	50⅛	1 10⅛	17 00	4 42½	20 85

NEW YORK, July 28.—Borax slightly weak, with lighter demand, 8¾@9c refined and powdered. Quicksilver firm at 76@76c. Lake Copper firm, 17@17¼c. This month the mining companies quote 17¾c for September and October. ARIZONA, 15¾c; casting, 14¾@15¾c. Moderate sale of pig Lead, $4 40@4.45.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 10.		WEEK ENDING July 17.		WEEK ENDING July 24.		WEEK ENDING July 31.	
Alpha	1 35	1 5	1 30	1 40	1 25	1 40	1 25	t 35
Alta	1.25	1.4	1.25	1.3	1 16	1.25	1.20	1 25
Andes	.65	.70	.60	.70	.60	.75	.65	.70
Belcher	2.75	3.30	2.80	3.15	2.55	2.90	2.50	3.00
Best & Belcher	3.35	4.50	3.75	4.25	3.65	4.20	3.75	3.90
Bullion	3.25	3.70	3.15	3.65	3.55	4.15	3.06	3.90
Bodie Con	1.10	1.4	.85	1.10	1.05	1.20	1.15	1 25
Bulwer	.25	.35	.25	.30	.25	....	.25	.30
Commonwealth	....	....	....	....	3 45	3.70	3.23	3.50
Con. Va. & Cal	4.35	4.75	4.00	4.25	3.75	4.20	3.85	3.90
Challenge	2.75	3.50	2.90	3 15	2.75	3.0	2 76	3.16
Chollar	3.76	4.15	3.65	3.95	3.70	4.00	3 20	3.65
Confidence	7.25	7.50	6.50	7.37	....	....	6.87	....
Con. Imperial	.40	.45	.40	....	.30	.40	.30	.40
Caledonia	.50	.55	.45	.50	.40	.45	.40	.45
Crown Point	2.70	3.25	2.65	3.15	2.60	3.0	2.65	3 10
Crocker	.20	....	.20	....	.20	.30	.25	.30
Del Monte	1.40	1.70	1.55	1.80	1.50	1.6	1.59	1.75
Eureka Con	....	....	4.00	4.25	4.50	....	3.75	4.25
Exchequer	1.00	1.20	.85	.95	.85	1.05	.85	.90
Grand Prize	.65	.70	.50	.65	....	....	.50	.55
Gould & Curry	2.80	2.80	2.55	3.05	2.60	2.95	2.60	2.75
Hale & Norcross	2.95	3.50	3.0	3.30	2.75	3.10	2.60	2 85
Julia	.25	.30	.25	.30	.30	....	.70	.25
Justice	1.55	1.60	1.50	1.10	1.45	1.55	40	1.50
Kentuck	1.45	1.60	1.40	1.50	1.30	1.4	1.25	1.40
Lady Wash	.35	....	.35	.40	....	....	.30	.35
Mono	.60	.80	.60	.65	.60	.65	.65	.75
Mexican	3.05	3.25	3.10	3.40	3.05	3.40	3.25	3 65
Navajo	.60	.75	.70	.75	.60	.65	.54	....
North Belle Isle	t.25	1.50	1.40	1.50	1.15	1.30	1.30	....
New Queen	.90	....	.85	1 00	.75	.85	.80	....
Occidental	1.65	1.85	1.60	1.75	1.40	1.60	1.20	1.35
Ophir	4.35	4.75	4.25	4.55	3.90	4.75	4.70	6.62
Overman	2.55	3.05	2.70	2.90	2.45	2 75	2 45	2.65
Potosi	7.62	8 50	7.25	8.00	7.50	8.25	5.37	7.75
Peerless	.25	....	.25	....	.20	.28	.20	....
Peer	.20	.25	.30	....	.15	.20	.15	.20
Savage	4 30	4.20	4 55	3 95	3.60	2 95	2 65	2.75
S. B. & M	1.70	2 20	1.90	2.00	1.70	1 95	1.65	1.90
Sierra Nevada	3.20	3.45	3 25	3.55	3.10	3.80	3.05	3.30
Silver Hill	.35	.4	.35	....	.35	....	.30	....
Scorpion	.25	....	.25	.30	.25	....	.25	....
Union Con	2.70	3.00	2.75	3.10	2.60	3.0	2 65	3.00
Utah	1.05	1.20	1.01	1.10	.90	1.10	.91	1.00
Yellow Jacket	2 80	3.40	3.00	3.35	2.95	3.30	2.95	3.55

Sales at San Francisco Stock Exchange.

THURSDAY, July 31, 9:30 A.M.

100	Alpha Con	200	Iowa
100	Alta	350	Mexican
150	Belcher	50	Mt. Diablo
400	Belle Isle	200	Occidental
150	Bodie	1550	Ophir
450	Bullion	150	Overman
3	Bulwer	250	Potosi
380	Con. Cal. & Va	30	Savage
100	Confidence	150	Seg. Belcher
100	Con. Imperial	100	Sierra Nevada
50	Crown Point	300	Silver Hill
50	Exchequer	300	Union Con
50	Hale & Nor	300	West Comstock
200	Hendricks	150	Yellow Jacket

	55c
	2.25
	1.10@1.15
	5.12½@5.25
	2.40
	7.12½
	3.90
	1.70
	30c
	3.45
	2.25
	3.40
	3.30
	2.85
	3.00
	3.55

San Francisco Metal Market.

WHOLESALE.

THURSDAY, July 31, 1890.

ANTIMONY	22½@	—
BORAX—Refined, in carload lots	8 @	—
Powdered " " "	8 @	—
Concentrated " " "	7¼@	—
All grades jobbing at an advance.		
COPPER—		
Bolt	23 @	25
Sheathing	23 @	25
Ingot, jobbing	20 @	—
do, wholesale	18 @	—
Fire Box Sheets	23 @	25
LEAD—Pig	4½@	5¼
Bar	5¾@	—
Sheet	7 @	—
Pipe	6¼@	—
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 65 @	—
Buck, ₱ bag	1 35 @	—
Chilled, do	2 05 @	—
QUICKSILVER—By the flask	57 00 @	—
Flasks, new	— @	—
Flasks, old	45 @	55
TINPLATE—B. V., steel grade, 14x20, to arrive	— @	—
B. V., steel grade, 14x20, spot	4 80 @	—
Charcoal, 14x20	6 75 @	7 00
do roofing, 14x20	6 00 @	—
do, do, 20x23	12 00 @	—
Pig tin, spot, ₱ lb	23½@	—
CHROME IRON ORE, ₱ ton	10 .00@	—
IRON—Bar, base	3 @	3½
Norway, base	4½@	6½
STEEL—English, lb	16 @	20
Carlton tool	9 @	9
Black Diamond tool	9 @	9
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—

	Spot.	To Load.
IRON—Glengarnock ton	34 00 @—	30 @ —
Eglinton, ton	34 00 @—	30 @ —
American Soft, No. 1, ton	— @32 00	30 @ —
Oregon Pig, ton	— @33 00	— @ —
Puget Sound	34 00 @—	— @ —
Clay Lane White	@28 00	28 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	— @	— @ —
Langloan	34 00 @—	30 @ —
Thorncliffe	34 00 @—	30 @ —
Gartsherrie	34 00 @—	30 @ —
Barrow	34 00 @—	30 @ —
Thomas	33 00 @—	30 @ —
Cargoflect	30 00 @—	26 @ —

MINING SHAREHOLDERS' DIRECTORY.

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ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Almont M Co	Arizona	2	4	July 12	Aug 13	Aug 30	S Harman	302 Montgomery St
Belcher M Co	Nevada	49	50	June 27	July 31	Aug 21	C L Perkins	327 Pine St
Bodie Cons M Co	California	12	25	June 16	July 22	Aug 22	B. L. Burling	309 Montgomery St
Boua Fors M Co	California	1	6	June 19	Aug 10	Sept 5	E K Taylor	12 Montgomery St
Cons Imperial M Co	Nevada	28	5	July 17	Aug 20	Sept 11	C L McCoy	329 Pine St
Cons Pacific M Co	California	14	10	July 21	Aug 20	F E Lucy		330 Pine St
Crescent M & M Co	California	4	25	June 24	Aug 2	Aug 29	J H Isbam	310 Pine St
Crocker M Co	Arizona	9	15	June 16	July 25	Aug 25	N T Messer	309 Montgomery St
Cruikshank G M Co	California	1	10	June 27	Aug 14	Aug 25	E J Koch	211 Sansome St
Exchequer M Co	Nevada	29	25	July 10	Aug 14	Sept 4	C E Elliott	309 Montgomery St
Golden Prize Con M Co	Nevada	1	25	June 19	July 30	Aug 18	C D Bennett	330 Pine St
Gover M Co	California	2	25	July 15	Aug 20	Sept 5	Gray Dew	13 and 15 Fremont St
Gray Eagle M Co	California	18	6	July 1	Aug 4	Aug 25	J M Buffington	303 California St
Silver King M Co	Arizona	3	20	June 9	July 17	Aug 11	A Waterman	309 Montgomery St
Staodard Cons M Co	California	3	50	June 2	July 15	Aug 14	J W Pew	310 Pine St
Tierakoff G M Co	California	4	1	June 9	July 26	Aug 23	W J Garnett	308 Pine St
True Cons M Co	California	9	2	May 26	July 21	Sept 15	J C Bates	424 California St
Union Cons M Co	Nevada	41	28	July 21	Aug 26	Sept 15	A W Barrows	303 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION	SECRETARY	OFFICE IN S. F	MEETING	DATE
Derbec Blue Gravel Co	California	T Wetzel	522 Montgomery St	Annual	Aug 5
New York Cons M Co	Nevada	C E Elliott	309 Montgomery St	Annual	Aug 2
True Cons M Co	California	J C Bates	424 California St	Annual	Aug 4

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gato	309 Montgomery St	25	Apr 5
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	Jun 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California	Grass Valley		2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Aug 11

D V. GOODSON and Albert S. Montrose of Bodie were killed by the explosion of a boiler while perfecting plans and experimenting with an improved mill for crushing ore. The boiler was an old one which had been in use for a long time.

HORACE D. RANLETT,

Ores, Mining, and Commission,

420 Montgomery St., S. F.

Ships under advances to smelting works in Boston New York, Swansea and Liverpool.

Twenty-one years' experience in Shipping Ores and Managing Mines.

Solicits consignments of Copper Produce and Management of Mining Matters.

All business conducted on Cash Basis.

Purchase and shipment of Mining Supplies A SPECIALTY.

Sales of Developed Copper Mines undertaken.

Business Manager of UNION COPPER MINE, Copperopolis, Cal.; NEWTON COPPER MINE, Amador Co., Cal.

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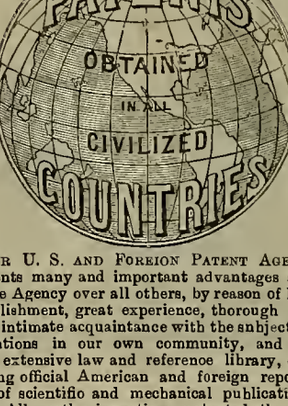

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Assessment Notices.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of Works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of July, 1890, an assessment, No. 18, of 6 cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of August, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 25th day of August, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California Street, San Francisco, California.

GOVER MINING COMPANY—LOCATION of principal place of business, San Francisco, California. Location of works, near Drytown, Amador county, California.

Notice is hereby given that at a meeting of the Board of Directors held on the 14th day of July, 1890, an assessment (No. 2) of twenty-five cents (25c) per share was levied upon the capital stock of the Corporation, payable immediately to the Secretary, at the office of the Company, 13 and 15 Fremont street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Wednesday, the 20th day of August, 1890, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 6th day of September, 1890, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

GRAY DEW, Secretary

Office, 13 and 15 Fremont St., San Francisco, California.

DELINQUENT SALE NOTICE.

CARMELO LAND AND COAL COMPANY, Location of principal place of business, San Francisco, California; location of works, Monterey county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 1) levied on the Fourth day of June, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
O'Connell, Annie A	18	100	$50 00
" "	19	100	50 00
" "	20	60	25 00
Green, Wm D	20	150	75 00
Eddy, Ira I	15	100	50 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of June, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 10, No. 415 Montgomery street, San Francisco, California, on SATURDAY, the Ninth (9th) day of August, 1890, at the hour of one o'clock P. M., of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

W. T BAGGETT, Secretary.

Office, Room 10, No. 415 Montgomery street, San Francisco, California.

CERTIFICATE OF PARTNERSHIP.

We certify that we constitute a partnership transacting business in the City and County of San Francisco, State of California, and in this State. Its principal place of business is at San Francisco, California. The name is CONNOR & GRANT. The full names and respective places of residence of all its members are signed hereto, and the said copartnership to commence June 1st, 1890.

SAMUEL B. CONNOR, San Francisco, Cal.
ANDREW S. GRANT, San Francisco, Cal.

STATE OF CALIFORNIA, } ss.
City and County of San Francisco, }

On this 12th day of July, in the year one thousand eight hundred and ninety, before me, Geo. T. Knox, a Notary Public in and for the City and County of San Francisco, personally appeared Samuel B. Connor, of said City and County and State, and Andrew S. Grant of the same place, each personally known to me to be the persons whose names are subscribed to, and who executed the within instrument, and they acknowledge to me that they executed the same.

In witness whereof, I have hereunto set my hand, and affixed my Official Seal, at my office, in the City and County of San Francisco, the day and year in this certificate first above written.

[NOTARIAL SEAL.] GEO. T. KNOX, Notary Public.

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, July 31, 1890. At a meeting of the Board of Directors of the abovenamed Company, held this day, a Dividend (No. 34) of One Dollar ($1.00) per share was declared, payable MONDAY, August 11, 1890, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer Books close August 5, 1890, at 3 o'clock P. M.

F. B. PRITCHARD, Secretary pro tem.

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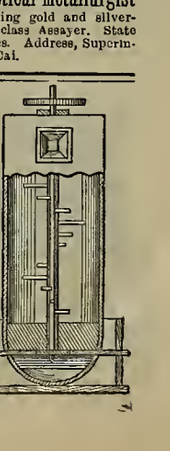

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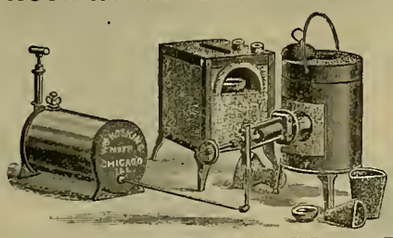

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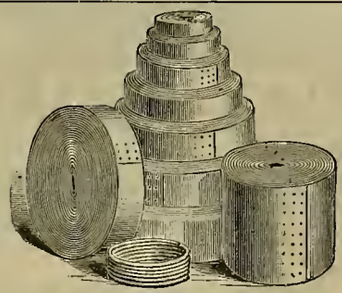

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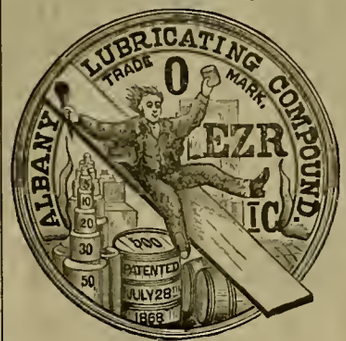

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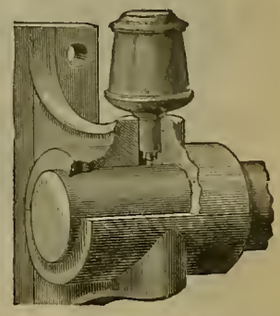

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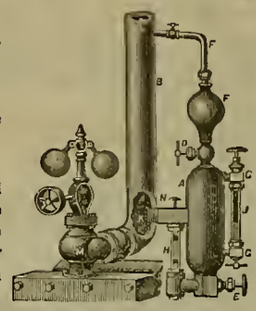

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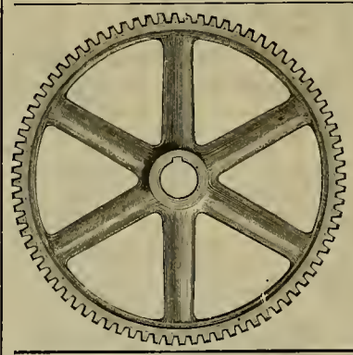

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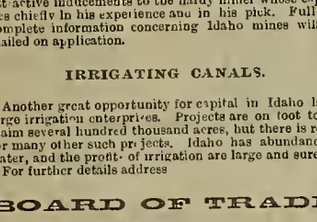

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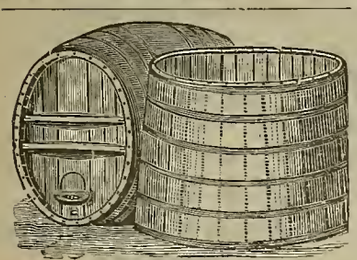

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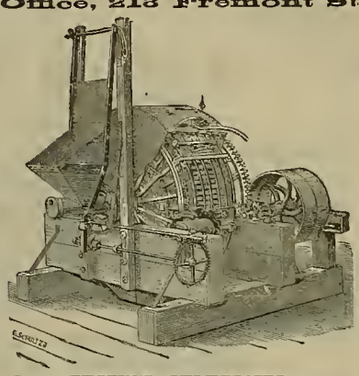

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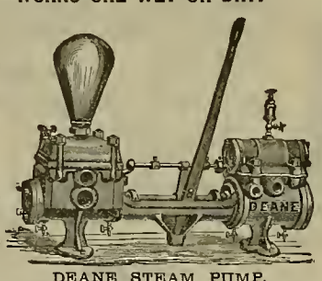

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COAL MINES OF THE WESTERN COAST.
A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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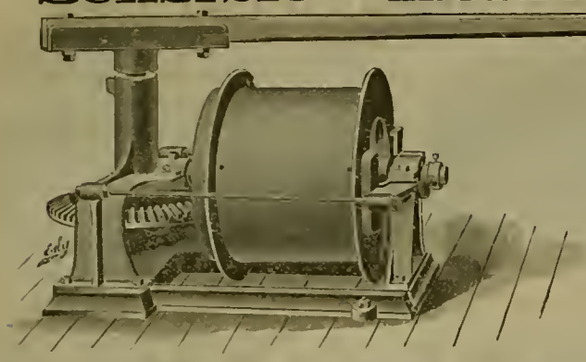

These Hoisting Whims are built entirely of Iron and Steel, mounted on a heavy base plate, and, consequently, are very durable and cannot be affected by extremes of either cold or heat or climatic influences.

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Weight of machine, 1200 pounds. Total shipping weight, including Sweep, Levers and Sheaves, 1400 pounds.

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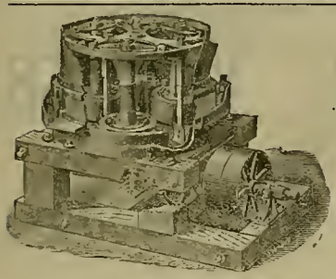

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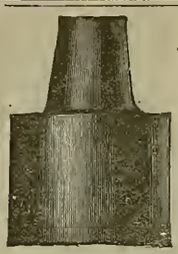

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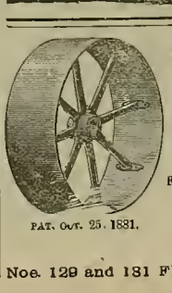

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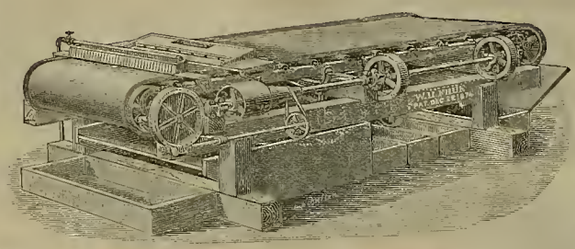

Protected by Patents December 22, 1874; September 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

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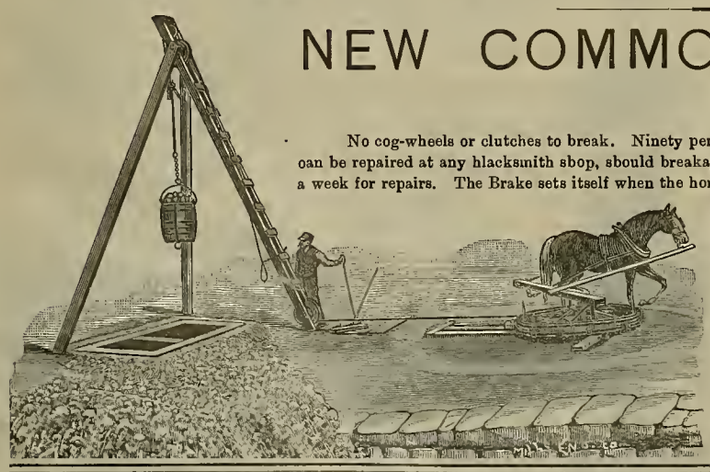

No cog-wheels or clutches to break. Ninety per cent of this Whim is wrought iron and steel, and will spring or bend before breaking, and besides can be repaired at any blacksmith shop, should breakage occur, thus obviating the necessity of sending away hundreds of miles sometimes, and waiting a week for repairs. The Brake sets itself when the horse stops or anything gives way.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 6.
DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 9, 1890.

Three Dollars per Annum.
Single Copies, 10 Cts.

Mineral, Not Agricultural.

An Important Decision For California Miners.

In the United States Circuit Court in this city, on Wednesday, a verdict for the defendant was rendered in the case of George H. Francoeur against Oscar Newhouse, an action in ejectment involving the title to the Eagle Bird mine, situated near the town of Washington, in Nevada county. The case has been on trial for three weeks, with the plaintiff represented by ex-Attorney General Hart, assisted by William Singer, attorney for the land department of the Central Pacific Railroad, and the defendant by Reinstein & Eisner and J. M. Sewell.

The plaintiff claimed the land under a deed issued to him by the Central Pacific Railroad Co. in February, 1890. On July 1, 1862, the railroad company received a grant from the Government embracing all the odd sections within ten miles of either side of their road, which excepted all mineral lands. By the United States Land Department it has ever since been considered an open question whether land can be considered mineral land unless a patent has been issued, or whether it must be entered on the books like any ordinary claim.

The defendant, Newhouse, in this case obtained a mining patent in 1887, on the strength of which he based his claim to possession. The Court instructed the jury that all such land as was readily ascertainable as mineral land in 1862, or at the date of definite location of the railroad, must be considered excepted from the grant, and the verdict found for the defendant was principally based on that issue, ignoring the plea of the plaintiff to the effect that the railroad company is entitled to all lands which were not known to contain minerals in July, 1862.

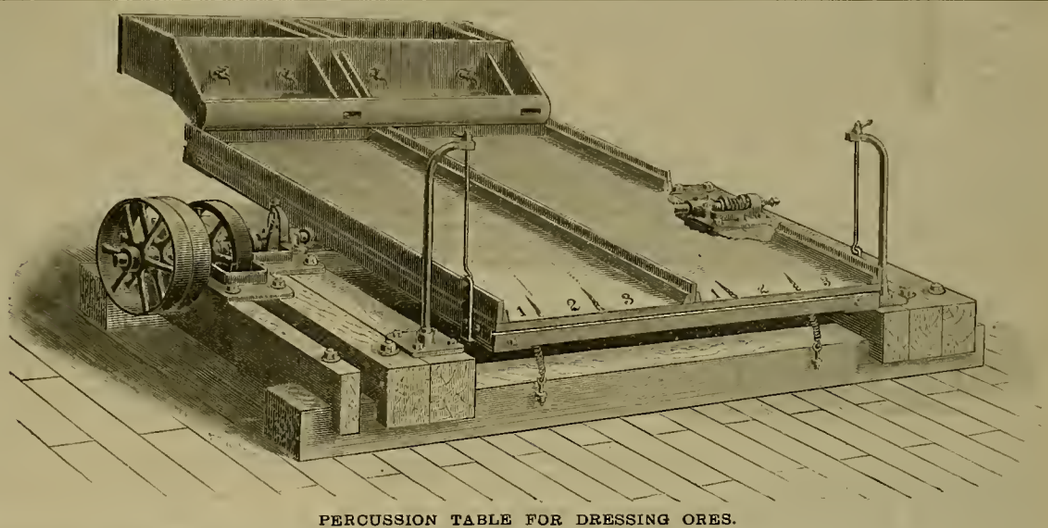
For the plaintiff it was maintained that the railroad grant of July 1, 1862, gave to the company a clear title to all odd sections of land, unless they were known to be mineral lands, and from which mineral in paying quantities was being taken previous to July 1, 1862.

This decision will be hailed with joy by all mine-owners on odd sections along the railroad. In the Sacramento land district alone, there are 750 patented claims located on odd sections, and the present owners of them have for months been watching the Francoeur-Newhouse case with much anxiety as to the final outcome. Many valuable mines in all parts of the State are situated likewise, and there is no doubt that the suit decided Wednesday was only brought as a test case, and that the railroad people were really the plaintiffs. Had the decision been the other way, a large number of similar complaints against other mine-owners would have been entered.

The jury find that the land was known to bear mineral when located by the R. R. Co., and should not have been listed as agricultural land.

This case is not only important to California, but to Idaho and Montana. In the latter State the Northern Pacific Co. is claiming large tracts of land on which mines have been worked for years. Yet it is claimed as agricultural.

A decision the reverse of that which has been given would have been a sad blow to the mining interests of this State. Not only quartz mines were in question, but large tracts of drift mining country as well. The mining community is to be congratulated on the results of this test case.



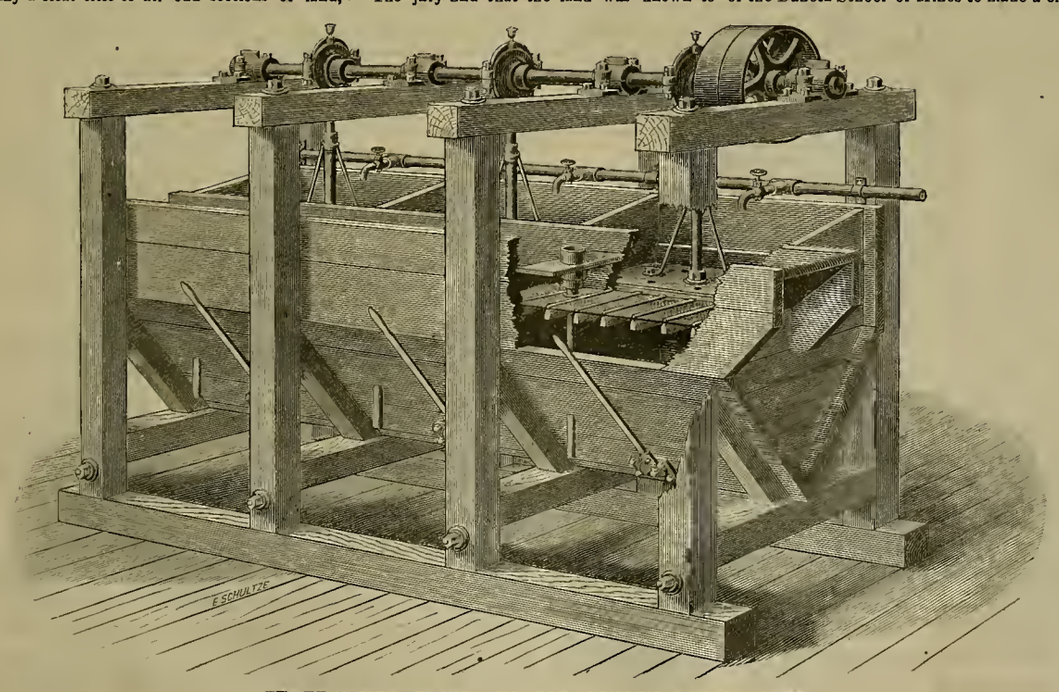
PERCUSSION TABLE FOR DRESSING ORES.

Dakota School of Mines.—The State Board of Regents recommended to the trustees of the Dakota School of Mines to make a clean sweep of the old faculty, and the trustees did it. The old faculty had become more or less involved in a sectional or factional fight. The object of the Regents was to make the school a State and not a local institution.

Jigs and Percussion Tables.

The accompanying cut shows a three-compartment jig with part of the side removed to show the screen and method of securing it in place. The ore is fed in the spout shown on the end of the jig to the first screen, and by the action of the loosely-fitting plunger, worked by an eccentric secured to the shaft on the top of the jig-frame, the water washes the lighter and coarser material over to the next screen, and so on until it has reached the last one, thus making a very complete concentration. The eccentrics are made of cast iron and generally keyed to the shaft but sometimes secured by set screws. The eccentric rods that operate the plunger are of wrought iron and have side braces to prevent twisting or bending. The boxes are babbitted and tight and loose pulleys are furnished. Cast-iron discharge gates are bolted to the side at the bottom as shown. The Union Iron Works of this city, who make this jig, are prepared to build jigs of any number of compartments that may be required.

The other engraving shows a percussion table of the kind extensively used in Germany in ore concentration, but not so common in this country. This is a common type of table and one that is cheap to build. It is hung by the bolts connected to the upright stands that are bolted to the timbers. This gives it a free motion, and by a peculiar mechanical device the table is pushed to one side and suddenly released and sent back by means of a spring on the opposite side. They are furnished with a tight and loose pulley as shown.



THREE-COMPARTMENT JIG FOR CONCENTRATING ORES.

James Whitlatch, a mining man well known all over the coast, committed suicide in this city last week. The cause was despondency due to financial troubles and poverty. He was the locator of the famous Whitlatch-Union mine, Montana, and has made and lost half a dozen fortunes since he began his mining career in California. Deceased was about 48 years of age.

CORRESPONDENCE

we admit, unindorsed, opinions of correspondents - EDS.

The Gold Belt of Northern California.

Ancient River Chan els and Gravel Deposits.

NUMBER IX

[Written for the MINING AND SCIENTIFIC PRESS by JAMES F. TALBOTT, Blue Canyon, Placer Co.]

Coaree Gold.

At Shady Run in the old Blue Bluff claims, a lead of coarse gold in apots has been followed several hundred feet back into the flat; nuggets weighing from 1 ounce to 20 and 30 ounces have been found in this lead. To the east of this flat or basin is a narrow outlet into Blue canyon. From this point down the canyon a mile or two, some extremely rich crevices were found, containing coarse gold of the same kind as that on the hill. At about a certain distance down the canyon the coarse gold gives out, and as in other places the richness diminishes. The canyon presents the same appearance for several miles above, but no pay has ever been found above this outlet.

The same conditons are observed on the Nevada ridge. From a rich deposit in Bear river, at the month of a small ravine, the pay was followed up the ravine into a richer deposit in the hill at Little York. The first discovery of hill diggings in California was at Nevada City, where the pay in a rich ravine was followed from Deer creek up into the richest and most extensive deposit of this character ever found in California or any other place—the famous "Old Coyote" lead. A peculiarity observed in regard to these

Rich Shallow Depoelte

On the hills is that they invariably face to the south or west. This is accounted for from the general slope of the country being in that direction, thereby giving free outlet; while a break, with an outlet to the east or north, is running against the elevation of the country in these directions and is soon blocked up; hence no extensive or rich deposits are found in these directions from the source; whereas, to the south and west the outlets are unobstructed, and the gold is concentrated in those places, under the conditions previously indicated.

In some localities very rich small deposits have been found, where no trace of the source can be observed. We can account for this from the fact that the immense deposit of lava, immediately overlying the main river-beds, and its solid indestructible character has resisted the action of modern erosion, while the greater portion of their lateral tributaries and canyons, being free of lava, have been swept away and entirely obliterated, and a portion of the gold that was in them has been deposited in these isolated spots, where no traces of its source have been left.

In some localities in the upper part of the gold belt some considerable sections of those tributaries still remain. On the Middle Fork Divide several are observed, as at Deadwood, Last Chance and other points. But as this is near the line of the main lava flow, the most of them are capped with lava.

On the southern slope of the North Fork Divide is one of quite and considerable extent at Lost Camp. This is an isolated section, situated about three miles a little north of east from Shady Run, and a mile and a half directly south from the town of Blue Canyon. It is about three-quarters of a mile in length, running east and west through a low sag in the ridge between the north branch of the North Fork and Blue Canyon, and is abruptly cut off at either end by a deep gorge. Between it and the Shady Run lava-capped ridge to the north, a high range of bedrock country intervenes, south of which no trace of lava is seen. On the south, toward the North Fork, is a high rim-rock. Immediately to the east the deep canyons and branches of the North Fork have swept the entire channel away for several miles in that direction, and apparently to near its source in the vicinity of Monumental, Barnett and Wilmot canyons, where considerable gravel deposits still remain. The upper portion of the channel in this section is considerably broken up, and the bottom deposit somewhat irregular. The top formation is an irregular mass of material from the surrounding country, composed chiefly of float quartz and bedrock but slightly worn, intermixed throughout with a body of light yellow clay. This is evidently from

An Immense Slide

Coming from the high bedrock range to the northeast, which probably blocked up the channel here and prevented this section from being carried away. At the lower or west end, from where it breaks off into Blue canyon, the channel is about 50 feet wide and well defined. The bedrock is hard and water-worn on the high points and pot-holes. The bottom stratum, in which the pay is found, is a solid compact body of gravel and bowlders from 5 to 10 feet in depth, principally quartz. The top formation is about the same as that at the east end, only more worn and rounded, with less clay in it, and is evidently a wash from the slide above, which has filled in above the bottom deposit to the depth of 50 feet and carried the lighter material on to the south rim a quarter of a mile beyond, where, on the bedrock points, a few feet in depth, a barren deposit of fine gravel intermixed with the yellow clay, is left.

An Isolated Section of Channel.

Here then, is an isolated section of a small well-defined channel, which unmistakably belonged to the ancient system. To the east an apparent connection can be made with gravel deposits indicating its source, but in no other direction can a vestige of the channel be discovered. To the north and northeast is a high bedrock country—on the south a high rim and two high bedrock ridges intervene between it and the Middle Fork Divide. To the west is the high rim of the channel in the Shady Run ridge, heretofore described.

The only course possible for it, then, is to the southwest — the natural course of all, ancient and modern. The natural conclusion is that this one-time channel, free from lava, ran about parallel with that in the Shady Run ridge, down to or below Bogus Point, where it formed a junction with the main one, and that the floods from the combined displaced waters of both divides rushed into this tributary and carried every trace of its existence away as far up as Lost Camp, cutting out the deep gorge of Blue canyon and other branches of the North Fork, when all of the forces were united and cut out the famous gorge of Giant's Gap, and below Bogus Point swept away every vestige of the main ancient channel of the North Fork divide.

Relatione Between Different Localities

This is a wide and deep subject, and most all of the articles heretofore written in regard to it appear to have been by some casual writer, visiting the rich and well-developed localities, unacquainted with the general character of the surrounding country and the existing relations between different localities. As a consequence those articles only reflect the narrow views of certain individuals, whose observations for the past twenty years, probably, have not extended beyond the vision of the principal saloons of the place, and who see in the deep gravel deposit of their locality, the main ancient river channel—the "Hub" of all the mines in the country, particularly if there is "blue gravel" in it.

It is not intended in this article to give any new information in regard to the mines on the Middle Fork Divide, but, for the purpose of comparison, to call attention to certain facts and to certain conditions observed on the surface that indicate to a degree of certainty the conditions of the underlying formation, which is practically demonstrated here by actual workings. Those surface indications have heretofore been outlined to some extent, and the underlying formation is brought into full view by extensive developments. The mud (cement) and lava flow inside the rim-rock walls has been traced on the surface for a long distance in a definite course, and, at different points, many miles apart. On this course deep shafts have been sunk and long tunnels have been run through the rim-rock, and the underlying formation of bowlders and gravel are found, containing the rich deposits of gold. Only where breaks occur through the rim to a certain depth are extensive and rich gravel deposits found outside the rim.

(To be Continued.)

The Accident at Hayden Hill Mines.

EDITORS PRESS:—A fearful accident happened at the Hayden Hill mines on July 24th, when two men lost their lives in the Eclipse mine.

Frank Auble and William Dunbar were down in their mine working, when a fire broke out in the buildings over the shaft. The fire is supposed to have started in the blacksmith shop close to the whim house. The house over the shaft taking fire, gave the men in the mine no possible chance for escape.

There being no one on the surface to give the alarm, the buildings were nearly consumed before being discovered by other miners on the Hill. The fire was soon extinguished after being discovered, but had meantime burned down the shaft the depth of two sets of timbers.

After the fire was extinguished, men were let down the shaft to learn the fate of Auble and Dunbar, but none could stand the suffocating atmosphere. Mr. L. Richie was the first to be let down the shaft and had to be hoisted up, being nearly suffocated.

About 8 P. M. word was telephoned to Mr. Charles Auble at Adin, brother of Frank Auble, and he immediately started for the Hill. Word was also sent to another brother, G. Auble, who resides seven miles from Adin.

Every attempt to enter the mines was fruitless until the next day, July 25th, when two of the Auble brothers succeeded in getting down to the 40 foot level. There in the drift about 60 feet from the main shaft were found the two dead miners. Mr. G. Auble being a man of courage, he succeeded in getting the lifeless remains out of the mine with the help of others. Both men belonged to the Odd Fellows' Society and were buried by the Order. There was a large procession of sympathizing friends. Mr. William Dunbar leaves a widow and two small children to mourn his sad fate. Mr. Auble leaves two children, his wife having died some years ago.

Both men have many sympathizing friends here. H. KELLEY.

Adin, Modoc Co., July 26, 1890.

San Bernardino County.

Its Mineral and Other Resources.

NUMBER V.

[Written for the PRESS by JAMES H. CROSSMAN.]

Calico Mountain

Calico mountain contains a species of coarse granite; hornblende and andesite also occur, but the nomenclature of these rocks, their origin or mode of occurrence does not interest the prospector, miner, or mine proprietor. He only seeks to know the size of the vein, the assay value of the ore and its character, whether free or base, copper, gold or silver. He wants to know if it goes in the deep and that the pay chute has sufficient longitudinal proportions. The answer satisfactory, the miner is content.

To the geologist and student, mineralogist and metallurgist, Calico mountain is a field of great interest. He can find here not only a great many varieties of rock, but evidences of intense volcanic activity, and many of the ores of silver, gold, copper and iron. He can also find typical specimens of all classes of veins known to exist. It is a free and open school for the student in which to take lessons in practical mining and milling preferable to either Freiburg or Berlin. There he can only obtain a theoretical knowledge of the art, but in Calico he combines theory with practice. Let him win his spurs and diploma from the rocky structure of some one of the many deep-seated fissures that abound in this region; learn the length of the chimney or chutes of ore; learn the difference between a "fissure" vein, a "blanket deposit," or a "gash" vein; learn how to pitch his hole in order to throw the most rock for a given amount of explosive material; learn the use of the tools of the craft, how to make a survey and an assay, how to manipulate the machinery in use. Then let him go to the mill and reduction works and learn the secrets of the millman's art. He will be then better qualified to judge of the character of a mineral vein or deposits than many who have graduated with all the honors and received their diplomas from the professors of the celebrated mining colleges of Germany and elsewhere. At least he will know the difference between a "true fissure vein" and a "crack." The latter term has been used by one of our prominent mining and scientific lights in his pronounced classification of all of the mineral-bearing veins that occur in the Calico mountain, which, to use his own classical expression, he dubs as "cracks."

In this connection I would state that it is not my object or intention to decry science or scientific attainments that have been acquired in the celebrated schools referred to, but theoretical knowledge without practical work in the field is of but little benefit.

The Ore-Bearing Material

That forms the gangue of the Calico veins consists principally of heavy spar, quartz, tufa, sandstone and indurated mud, the latter evidently ejected from some deep-seated source as a volcanic product, and often found rich in the ores of silver.

The most notable, extensively worked and best defined veins on the Calico mountain are the King and Waterloo. They carry smooth and well-defined inclining walls showing "slickensides" (gouge) for long distances. Several of the veins on Calico mountain cut the formation at varying angles and so far as exploited, show no signs of weakening as "they go to the deep." Certainly no surface crack or superficial deposits could have produced these results. If these general characteristics do not constitute a "true fissure," not a "crack," my 42 years' experience from Cerro Pasco, Peru, to the Comstock of Virginia City, goes for naught. On the northerly flank of the Calico mountain an important and interesting bed or measure of crystalline borates occur, known as "colmanite," of an unusual high tenor in its boracic product. This seam or measure carries transparent crystals of extraordinary beauty and in great quantities. They are sought for and highly prized by all of the scientific institutions in the world. This mine is being extensively worked and its product daily shipped to San Francisco via Daggett for refining. Details of not only this but of other mines in the county will be described later under their appropriate head.

Avawatz Mountain.

Course northwesterly and southeasterly, 25 miles in length by 20 wide. Its greatest elevation is 6500 feet, aneroid reading. This mountain is situated about 60 miles in an air line nearly due north from Calico. The formation, mineralogical structure and character of its ores resemble in a marked degree those of the Ord Mountain which I have previously described. Kaolin and foliated talc are found in great abundance. Near the summit of the highest peaks veins of gold, silver, copper and lead occur. About 30 miles northeasterly from Cave Wells, which are located about 2½ miles easterly from the summit of the Avawatz range on the road leading from Daggett to the Amargosa Borax works and Resting Springs mine, a high, gloomy, desolate range of mountains is seen, known as the

Kingston Range.

This is the first range of mountains encountered after crossing the southerly rim of the Death Valley basin. It is marked by high and almost vertical peaks—the highest of which is Kingston Peak, which is 8000 feet above the level of the sea and forms a prominent landmark. The range, peak and spring at its base derive their names from a man by the name of Kingston who formerly had a contract for and carried the mail between Salt Lake City and San Bernardino county, when life on the desert held an uncertain tenure, owing to Indian raids. On its northerly end large deposits of argentiferous galena occur. This mountain, including Good Spring mountain, is 12 miles long by six in width. Course due north and south. Its axis is granitic. On its westerly bank a secondary granitic rock occurs and on the east a lime belt of great strength and persistence is seen. About six miles northerly from the above named peak is a low range apparently an off-shoot from the main Kingston mountain. The extensive argentiferous lead deposits surrounding Resting Springs occur on the northerly extremity of the main range. At this point the mountain is shattered and broken until finally, losing its integrity in Ash meadows 25 miles distant, it altogether disappears. The same formation extends in a southerly direction through Good and Resting Springs.

Good Spring Mountain

Lies southeast of Kingston and in line with it. The formation is granite and a stratified limestone and a lime schist much broken by volcanic action. Metalliferous veins of quartz occur, carrying the ores of lead, silver and gold. This mountain is a prolongation of Kingston range.

Traveling in a southeasterly course from Tacopa a distance of about 40 miles, we reach

Clark Mountain.

Its course is northerly and southerly, and it is about 20 miles long by 10 wide. It reaches its greatest elevation on its southerly end, where Clark's Peak rises to a hight of 4200 feet above the level of the sea. This peak is a noticeable landmark that can be seen from almost any elevated position in the desert for a long distance. Its most northern point terminates in Nye county, Nevada. This mountain range is celebrated for its ores of silver, copper and lead—the first of extraordinary richness and known as a silver-copper glance.

East of the last-named mountain range, crossing 20 miles of a desert whose only vegetable product is the cactus and an occasional tuft of bunch-grass, we reach the

New York Range.

Its course is north and south; it is 20 miles long by from 4 to 6 in width; elevation, 2200 feet. Through this mountain there courses longitudinally important mineral-bearing veins that crop boldly, their crests exposed for long distances. The ores are of copper, silver and lead. Thence easterly for a distance of 20 miles, we reach a low mountain range that borders on and forms the westerly rim of the Colorado river, which is known as the

Colorado Range.

This range extends in a southerly direction to a point near the boundary line of San Diego. The range contains several important mineral districts, carrying the ores of gold, silver, copper and lead, particularly below The Needles. In the more northern portion of the county, adjoining the Nevada State line,

The Yellow Pine Range

Occurs. Its trend is from northwest to southeast, with Charleston Peak its highest point, reaching an elevation of 10,844 feet. This is snow-clad the most of the year, particularly so on its northerly exposure. A broad belt of lime courses longitudinally through this range which contains fossil marine shells. This mountain, at an elevation of from 4000 to 6000 feet, is covered by an important belt of pine timber which is largely owned and controlled by Mr. N. Clark, who has erected a sawmill on the belt which he utilizes whenever there is a demand for lumber. The best timbered portion of the range enters Nevada from 10 to 20 miles northeast of the California State line. This belt of timber lies principally to the east of Charleston Peak, which is distant 150 miles northeast from the town of Daggett. The range extends from Providence mountain on the south to Pahranagat valley on the north. The valley is well watered and noted for the fertility of its soil, producing large crops of all of the vegetable products of the temperate zone. It is extensively cultivated by enterprising farmers. Stock find good pasturage in the foothills of the valley.

Returning to Clark's mountain again, we travel due south for a distance of 42 miles and reach the town of Providence on the easterly flank of the central portion of

Providence Mountain.

The course or trend of this mountain is northwest and southeast. It has a greater longitudinal extent than any mountain range in San Bernardino county north of the San Bernardino range of mountains. Its extreme length, inclusive of Old Dad on the south, from which it is only divided by a low pass, and the Macedonia and New York ranges on the north (connected the entire distance by low ranges of hills), may be estimated as follows:

Old Dad, ten miles long by eight miles wide; Providence proper, 20 miles long by eight miles wide; Macedonia mountain, including a low connecting range of hills 42 miles long by four wide in its widest place; New York range, ten miles long by four wide, forming in the aggregate a mountain range 82 miles in length by from four to ten miles in width.

The central portion of this mountain is Providence proper, and contains many marked features of great interest to both miner and

scientist. To the first its attractive features consist in its great store of mineral wealth, the details of which will be more fully described under the head of "Mineral Districts and their Mines." The scientist will probably be more interested in its structural formation and geological character. It is bounded on the east by an extensive valley which is from 30 to 40 miles in width and more than 100 miles in length.

Volcanic Structure.

This valley is dotted with volcanic cones that at no remote period in the world's history poured forth mud and broken rocky fragments. In the near vicinity, conical peaks, with their lava-covered flanks and basalt capped summits, form tablelands of considerable extent, and stretching away to the west, furnish evidence of the enormous mass of molten material ejected from these vents. This period of volcanic activity was, in all probability, contemporaneous with that which destroyed the integrity of Calico mountain and vicinity. Providence mountain proper, looking from the east at a point near Fenner on the line of the Atlantic & Pacific R. R., has the appearance of a sharp, serrated ridge, with vertical cliffs and steep canyons. It is composed of many varieties of rock, much metamorphosed and showing the effects of powerful heat, with dykes of eruptive rock of from 200 to 400 feet in width. The formation, however, is more regular and less disturbed than one would expect.

Ore-Bearing Veins.

Its central core is evidently granite, while on both the easterly and westerly flanks broad belts of limestone occur from two to three miles in width, usually dolomitic, alternating with bands of porphyry, secondary granite, quartzite and talcose slates, inclosing numerous strong veins of quartz and spar on their contact lines. These are persistent and course for miles uninterruptedly, forming the metalliferous domain of the district and range. The ore-bearing veins often expand into large chambers, and in places contract to a seam, but are continuous on their line of strike. A noticeable feature where expansions take place is that large feeders or spurs fall in, and at their intersection the ores are invariably rich. The writer followed this belt for a distance of eight miles without noticing a break or dislocation. This occurs at an elevation of 4000 feet above the sea level.

On the easterly flank of the mountain the ores bear silver-lead and silver in the form of a chloride, usually accompanied by zinc either as a sulphide or as an oxide. On the westerly slope of the range, from three to six miles distant at a right angle, the ores carry gold, silver and lead. The want of water and fuel seems to have been the principal obstacle in the way of making this a large and productive mining camp. To obviate this difficulty and supply this much-needed want, extensive reservoirs should be constructed at suitable places to conserve the waters that run to waste, and artesian water should be sought for in the valley. The mountain is not destitute of a limited supply of the aqueous fluid. Springs of pure limpid water gush forth from several places on the flanks.

Old Dad

Is a mountain 15 miles long and 10 wide, and on the south is the dominant peak of the Providence mountain range. Its elevation is 6300 feet above the level of the sea (aneroid readings) and in the winter months it is clad with a mantle of snow. The dividing line between it and the Providence mountain proper is a low pass through which a road leads to the interior desert region of the Death Valley country. Old Dad is situated 25 miles westerly from Danby and 40 miles from the base of Old Woman's mountain, which lies in an easterly direction. Its formation is similar to that of Providence and contains metalliferous veins of the precious metal. Its extreme southerly point is within six miles of Danby, a station on the A. & P. R. R.

The Rock Spring Range

Courses southwest and northeast and at a right angle with the Providence range, bisecting it in a northerly direction from Providence proper. It is entirely composed of granite of an older formation than any that I have seen in the desert. It contains numerous springs of water but no minerals.

The Old Woman's Mountain

Lies at an elevation of 4500 feet, in an easterly direction. Its course is northeast and southwest, 30 miles long and 20 in width. It derives its name from a pinnacle of granite that stands alone on the summit of the ridge in bold relief against the horizon. This solitary figure rises to a hight of from 30 to 40 feet, and at the distance of a few miles resembles in a marked degree the statue of an aged human being of the feminine persuasion dressed in fashionable attire.

The resemblance is so striking that the observer can scarcely believe that it is not a work of art executed by some vagrant artistic sculptor who had strayed into these desert regions and left evidences of his skill. This mountain is 30 miles in length by 20 in width. Its axis is a secondary granite with a northerly and southerly trend. The mountain is bisected by a strong belt of magnesian limestone accompanied by calcareous shale and magnesian and talcose slates which carry strong veins of quartz charged with the ores of lead and silver. In the granite adjoining the veins are small but well defined. The ores are of copper and gold. The nearest point to rail (the A. & P.) is eight miles north at Danby, to which a trail has been built to pack ores from the mines. The Clipper mountain range lies south and west of the A. & P. R. R. It is 10 miles long by five wide; its greatest elevation is 7000 feet.

Sheep Mountain

Lies in a southwesterly direction from Danby, distant eight miles. Its formation is granite on the west and porphyry on its easterly flank. Lying parallel and adjoining is a belt of dolomitic limestone from 50 to 250 feet in width in which and on its line of contact, a large bed of specular iron occurs. This is the lime belt that crosses and enters the Old Woman's mountain. This mountain on its westerly flank shows evidence of volcanic activity; a number of large mud cones are seen at its base.

Sheep Mountain.

As seen in the distance, is one of considerable length, but rising to no great hight. It lies parallel with the course of the Atlantic & Pacific railroad, forming the southerly rim of that portion of the desert region through which the road passes. It is reported to contain metalliferous veins.

Iron Mountain

Courses easterly and westerly, and is ten miles long by 3½ wide. It is nearly due south from Old Woman's mountain, 57 miles southeast from Danby and 42 miles westerly from the Colorado river. It contains gold, iron, and an immense deposit of copper. The latter is reported to be of a high tenor, assaying 38 per cent copper, and from $20 to $75 gold per ton.

In writing the foregoing articles on the mountain ranges of the desert regions, the writer has confined himself as closely as possible to the geological features of the several mountain ranges, with but little reference to its detailed mineralogical character which will be presented under the head of "Mineral Districts." That the desert region contains immense stores of mineral wealth no intelligent man who has visited these sections can question. Want of cheap transportation, fuel, which the railroad can supply, water, which can be drawn from subterranean sources by the assistance of artesian wells and artificial reservoirs to conserve the water that falls from the heavens, have hitherto been the drawbacks that prevented the full development of this region.

(To be Continued.)

Mines and Mills of Shasta County.

NUMBER VII.

[From Our Traveling Correspondent.]

Extensive Reduction Works of the Calumet Co.

As stated in my last, the Calumet Co. owns on the same line of lode of the Walkers. This company has 3433 feet, embracing the Grand Prize, Wedge and Washington mines. The lode runs in a northerly direction, crops boldly, and is from 4 to 10 feet wide. The whole line of croppings is heavily sulphureted. In milling, it gives from one to two per cent, so there is no end to sulphurets that will average $100 per ton, I would judge. The rock carries free gold as well. A large amount of work has been done on the three several mines in way of shafts, tunnels, stopes, etc., and yet the depth reached is not 150 feet. Hoisting machinery is now on the ground for erection.

Ore dumps, having near by the terminus of a tram road, receive ore from the several mines. At the southern end of the claims a tunnel has been started on the lode, which is now in some 200 feet, and which it is proposed to continue for the entire length of the claims, which, continued, would come out into daylight on the opposite side of the mountain in about one mile. At the mouth of this tunnel is another branch of the railroad, which leads to the mill, a distance of about three miles.

The ore is transferred to mill by mule-power, but the company expect to put down in the near future a Trail and place thereon an electric motor. On the line of this road, which has a regular grade, there are a number of trestles over which the mule travels unconcerned, the highest being 52 feet. To the south of the mines above referred to, the company owns several other properties which are being worked, one of which—the Poorman—has hoisting works already on. This is a smaller mine, but richer, the lode being from two to four feet in width.

Following the road down, we soon take in a fine view, including the Sacramento river, surrounding hills, valleys and fine grounds and mills of the Calumet Co. The road terminates some 60 feet above the mill, where the ore is dumped into chutes.

These works being the largest and finest in Northern California, we set ourselves down for giving an extended review of them.

The mill-site is certainly the finest, most elaborately laid out one, not only in California, but of all the mining States we have traveled in. One does not comprehend, until he is on the spot, how systematic, practical, novel, neat, and complete every part is.

The mill-site consists of 20 acres patented ground, and is situated six miles above Redding in this same Old Diggings Mining District, on the east bank of the Sacramento river, and within a stone's throw of the California & Oregon railroad, which is on the opposite side. The ground rises gently from the river, having moderately high hills in the background. The place originally was an Indian rancherea, then the locale of the placer miner; now four mills and one furnace with fine grounds have taken their place. The regular crushing works consist of 2 Paul 12 stamp circular batteries, making 24 all told; these have a reducing capacity of 40 tons per 24 hours.

These mills have attached to them a full complement of silver plates and a new oscillating blanket concentrator. There is also 60 feet of the Robbins riffle. The plan of working is:

1st. Crushing the ore by a Blake breaker.

2d. Stamping to No. 8 screen. They amalgamate in the battery. The pulp flows over a large surface of silver plates, then on to the oscillating blankets, which are used mainly for taking up the gold, and will not amalgamate; also sulphurets. Then comes the Robbins riffle, where more or less sulphurets are also saved; the pulp, relieved of the sulphurets, passes on to the "Americanized" arastras (which have stone bottoms and drags). The tailings, as we will now call them, are worked on "arastra" fashion; silver plates are so arranged that no pulp passes off without passing over them. The arrangement is very complete and practical. There are four of these arastras, which we should state are also a Paul invention; each battery has the same complement of machinery.

Every millman will say that this is very thorough working, and yet they have a loss, which makes the stamps, with the use of water, compared with the results of their dry working, unsatisfactory. We were told there was so much difference, after the best work that could be given by battery working, as to make it likely they would stop the stamps altogether, excepting when they would work low-grade ore, simply for concentrating the sulphurets it might contain. This assertion made us look at the dry mills with greater interest. There are two of these mills some 500 feet apart. We neglected to say to start with, that all the works are run by water-power, the source of the water being about 8 miles from the mills. The water-right covers about 3000 inches, but for the most of the year there is not over 500 inches available, and this falls to about 200 inches in the last month of the hot season; still, having 250 feet head, they have a vast power at command and more than they now utilize. The water-wheel used is of the Knight pattern; they also use the Knight hydraulic gate, by which a boy can start or shut off all the machinery with the greatest ease. To bring this water from its source there is, with the ditch and flumes, some 2000 feet of 3 feet diameter iron pipe, for carrying the water from the top of one hill to the top of another. All the ditches, flumes and pipes are on the west side of the river, and terminate at an elevation some 250 feet above the point required for use. All water not actually required for use is turned down into the Sacramento, while the amount required is conveyed through another gate to the pipes that lead to the works.

At the terminus of the ditch commences a line of pipe down the hill, and this gives a pressure of about 200 feet perpendicular. The works being on the opposite side, it became necessary to build a bridge, and there is now built one of the strongest and neatest wire-suspension bridges we have seen anywhere. It is one span of 325 feet from tower to tower. On this bridge is laid the large 16 inch pipe which carries the water. The bridge has a capacity of holding 40 tons, although only about 18 is now on it. The bridge is a great local convenience, as it is allowed to be used for a free foot-bridge, there being a good walk on either side of the pipe. From the bridge, the pipes run some 500 feet on trestle-work to the mill. It was a big and expensive work getting the water to the mill, but once there, all miners can appreciate its value and saving. The entire cost of bringing this water to mill was about $70 000. Water is used in one set of mills, then passes on some 500 feet to what is called the lower mill, where it is used over again. This same water can be utilized several times by carrying it on down the river banks. As to the dry mills, we found these especially interesting from the fact that the process and mode of operating machinery was new and novel. The larger mill adjoins the battery-mill and is driven by the same power. As we throw our eyes up to view the machinery, we see prominently posted what in part explains the mode of working: "The Paul Dry Amalgamating Barrel Process," patented. All ores are amalgamated dry in cylinders, but to have it more comprehensive to the reader as it is new, we will give the operation from the rock-breaker down.

The breaker is a "Gates" which reduces the ore to about a No. 3 wire screen, reducing at the same time a large percentage much finer. This ore is reduced is elevated to a revolving screen, No 5 mesh, which sieved ore is conveyed to the dryer, while the part not fine enough is returned to the crusher. The ore is dried by steam pipes, instead of fire. As soon as the ore is freed of all dampness, it is transferred to the self-feeder of the pulverizing barrel, which automatically feeds for pulverizing to No. 60 mesh. From the pulverizer the ore is conveyed to another hopper, from which it is transfered to the amalgamating barrel, where it is charged with a large per cent of quicksilver, and such chemicals as are suitable to the ore worked; the charge is then revolved for a given length of time, and this depends on the ore worked, when it is ready for discharging.

When the operation is concluded, in every particle of the charge, mercury in a very fine state can be found; no teaspoonful of the heavy charge but contains it, showing it has permeated every particle. We must say that we are strongly impressed with this system of amalgamation, and especially where the gold is fine. The question in our mind was, as no doubt it is with the reader, how could all this fine 'quick' which must carry the gold be brought together and without serious loss. This point was soon solved to our satisfaction, by Mr. Paul, who favored us with his presence and explanations in examination of the works.

The amalgamated ore was now discharged into a second cylinder, which was charged with hot water, and further chemicals. This cylinder was now set in motion and revolved for a given length of time. When ready for discharging a small valve is opened, and without stopping the cylinder, and to our surprise, the quick began to flow out of an iron pipe in a good-sized stream, until some 100 pounds had been discharged into a receiver; this being the amount used in the charge. But this Mr. Paul said had no gold in it, which was another puzzler until explained. The explanation is, that when the valve is opened, the quick leaves the cylinder and passes into the amalgam safe, which is a regular safe with a lock and key, where the amalgam is deposited, and then the mercury flows off into the receiver to be used again. This safe is also Paul's invention. In using this safe no one sees, knows, or can handle any amalgam except the party who holds the key. It is a complete operating contrivance, and works to a charm. The ore which now requires washing off, passes over a silver plate and vibrating table having silver plates; this table is a check for taking up any small particles of quick that might not have gathered in the first operation. From this table the ore passes over an oscillating blanket concentrator, where the sulphurets and other metallic substances are taken up. At stated periods the blankets are washed into a receiver below, from which they pass off to a reservoir especially for sulphurets; the residue now passes off as valueless tailings, and we think they are. The oscillating blanket tables are 14 feet long, and oscillates as the material to be concentrated is washing over, so the surface of the blanket is all the time free of sand piles, so usual on stationary ones. They worked well.

Some 500 feet down-stream from mill just described is another of the same kind. This mill also runs by water-power, the waste water from the other mill being run underground to the mill below. At this place is also a large reverberatory furnace, one of the most complete we have seen in our travels. This furnace is for treating the sulphurets as gathered by both the wet and dry mills. When the sulphurets are completely desulphurized, and while they are in a heated state, they are fed and treated in the same manner as in dry mill described, excepting the sulphurets are reduced to flour in fineness.

Not wishing to pry too closely into the business of the company, we did not get at the per cent saved by this plan of working, but were informed that, all things considered, it was far more profitable than either chlorination or the plan of disposing of the sulphurets. So much for the mills.

We now look around and see in front the cold, clear Sacramento river, and to the right of the mill, and between it and the river, is a good-sized orchard and vineyard—in fact on both sides of the mill is an orchard. On the place are peach, pear, apple, apricot, nectarine, quince, cherry, olive, orange, English walnut, fig, plum, Italian chestnut, black walnut, almond, and other kinds of trees of best varieties and all kinds of berries. Not only has great attention been given to fruits, but there are some 300 feet of flower-beds that grace the grounds. There is quite a large variety of roses and all of the finest varieties. They raise all the vegetables required for their use, and melons in profusion. Order and cleanliness seems to be the first law about his place. All buildings are placed in line with the mills, and in front of all is an avenue of some 35 feet in width and about 400 feet long, and this is lined with shade and fruit trees and flower-beds, the mulberry being a very conspicuous tree. On the line several large oaks also grace the grounds. The gardens, orchards and vineyards are inclosed with picket fence, and all, including the buildings, are whitewashed. The contract between the green and white is fine to view. Having an abundant supply of water, after its use as power it performs another duty in irrigating the grounds.

This spot was wild when the company first settled upon it, but little over three years ago. It is one of the grandest marks of what changes capital, industry and taste will do in the way of making a waste blossom as the rose. In the way of living, the employes of the Calumet must fare well, as all share in the good things of the company's grounds. We neglected to state, which our remarks call up, that chickens, turkeys and pigeons seemed plenty. The company work from 30 to 50 hands, according to season and requirements, and as they board their hands, they have a market for all they produce. They work on the principle that money saved is money made. The Calumet Co. is an Ohio company, Ohio capital entirely. Dr. W. H. Garlick is the president, and Almarin B. Paul, one of the oldest miners on the coast, is general manager. Mr. Paul has been manager from the start, and to his taste and industry all is due. All things considered, we cannot otherwise than extend our appreciation for courtesies tendered.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alameda.

CHROME.—Livermore *Herald*, July 26: The James Mendenhall chrome mine is turning out a large amount of ore, and will begin hauling in a few days.

Amador.

HARDENBURGH.—Amador *Ledger*, Aug. 2: The Hardenhurgh mine is drained to a depth of about 400 feet, leaving about 50 feet more to reach bottom. James Evans has resigned from the superintendency and has been succeeded by Mr. Howland.

Butte

MINING DEVELOPMENTS.—Oroville *Register*, July 28: This summer shows more active mining developments in Butte than for many years past. Some of the richest and best mines are tied up in lawsuits, but in new mines there is much push and activity. Mention has been made of the great work done on the Golden Gate. The sale of the Greek mine and the old Cape claim was consummated and the money paid on Saturday last to the various owners. The rich returns from the Forhestown mines are attracting capital and a number of new ledges give fine indications for the future. Lately full details were given of the new mill going up on the Perkins & Gallagher quartz mine. The Palo Alto M. Co., near Buckeye, have purchased the Douglas mine, owned by Messrs. Farnham, Rowell, Gabriel and others. The American Eagle mine and others in the same neighborhood are being developed. The Patterson gravel mine, near the famous Carr mine, is paying from $8 to $50 a day for four men. The Carr mine is known to be very rich. The Reese mine, owned by Messrs. Reese, Walker & Smith, is being opened by a tunnel. The Rainbow mine, near Yankee Hill, is paying very handsomely. Others might be instanced, but enough names have been given to show how active mining developments are this season. The amount of gold shipped from this town is not less than $25,000 a month, while the shipment by private parties, mostly Chinese, is very large. Mining in Butte is only fairly started and within five years it will attain such proportions as to attract attention in all quarters.

GOLDEN GATE.—Work on the Golden Gate mine is being pushed ahead with all possible dispatch. Men are working night and day to get in the head dam and finish the big flume. We drove out to the mine on Tuesday night at half-past seven and found a large number of men at work filling in the cribs with as heavy rock as could be handled. The big rocks will remain without moving until the timbers themselves rot down. The long flume is already in place, though the bottom boards will not be laid till the water is ready to be turned in so as to prevent shrinking up and allowing the water to escape. Only one crib more was needed to be put in place to begin raising the stream. The river has fallen very rapidly and is now within five feet of low water. Unless some unforeseen accidents happen the mine will be opened in good season and there will be every facility for working the whole bed of the river in a most thorough manner. The greatest energy has been displayed by Manager McLaughlin and every possible contingency has been provided for. The mine is one of the busiest spots in the State, and work never ceases during the whole 24 hours of the day and night.

WORKING CEMENT.—In this county there are vast deposits of cement that have long been thought rich enough to pay well to work. Hitherto all attempts to get the gold have proved failures. In an early day a mill was started at or near Bangor and run for some time. Owing to the great number and extreme hardness of the rocks which were contained in the cement, the mill was finally stopped. On top the cement paid well, but deeper down the pay grew less. It was thought the pay streak had been passed through, but the miners did not begin again nearer the surface on account of the difficulty they had in working the very hard rocks. Twenty or more years ago Captain Darrah and Thos. Callow took a large quantity of cement from the deep beds of it, near old Lynchburg, a mile south of Oroville, and attempted to work it by a steam process at a sawmill that was running at the upper end of town. After a two months' trial they gave up the effort as unprofitable. Attempts are now being made to successfully work the rich cement in the Cherokee mine. There are vast deposits of it there and it is said to contain from six to eight dollars a ton in gold. Should they be able to grind this up successfully and obtain the gold, it will induce the building of a mill at once. Several parties from S. F. have leased ground at Cherokee and are now putting up machinery to test this deposit. Should the tests be successful they will open a wide field for profitable gold production.

Calaveras.

AROUND ANGELS.—*Mountain Echo*, Aug. 2: The Utica mine is in full operation day and night and the scene at the mine is that of general activity. The 60-stamp mill is kept in almost constant motion, the full complement of stamps being employed crushing ore. The work of sinking the old Leeper shaft goes steadily on, while work in the various stopes in the north end is being prosecuted with a vim. There is abundance of ore in sight in these stopes. The mine is yielding good returns. The Angels mine is being operated day and night. Work is progressing in the Potter shaft constantly, and as nearly as we can ascertain, the mine throughout is looking excellent. The work of sinking the Stickle mine is kept up day and night and with satisfactory result. The contract let calls for the sinking of 200 feet, which, when completed, will make the shaft 600 feet in depth and on a level with the north and south shafts of the Utica mine. The Gold Cliff mine is again in running order and the work of extracting ore is being carried on briskly. The mill has been overhauled within the past two weeks and in many ways improved. Messrs. Hallock and Hickok are working their mine west of town and extracting a good grade of ore. They are crushing their rock in an arastra at present, and we are informed that the ore pays sufficiently to warrant putting up a 10-stamp mill, and this the owners intend doing in a few months. The work of extracting ore in the Lane and Tulloch mine goes on steadily. The mill, which, by the way, has been increased to ten stamps, has been started up and is now in excellent running order. The mine looks exceedingly well. The chlorine works east of town are kept in constant operation. The furnaces are kept employed roasting sulphurets from the Utica mine and other mines. The present capacity of the works are inadequate to roast the increasing supply of sulphurets, and in consequence, new works similar in size and construction are to be added, the bricks for the construction of which are now being made. The work of building the additional furnaces will soon be commenced.

THE UNION MINE.—*Prospect*, Aug. 2: The English company which formerly operated this mine, and which owns it, has squared all outstanding accounts, it is said, and is about to open up again with an increased force. Teams are already engaged for hauling timber, etc., and a force of 50 men will be required almost immediately. The superintendent is now on his way here to take charge and prosecute the work.

Fresno.

VALUABLE IRON ORE.—Fresno *Republican*, Aug. 1: P. B. Donahoo and wife, C. Nelson and wife, M. Denicke, C. Beck, J. Robinson, and Peter and John Hansen left yesterday to inspect a valuable iron ledge just discovered this side of the iron deposits of the Minarets. The ore assays 68 per cent iron, being one per cent higher than the richest ore from the Minarets. Samples have been sent East for assay, and if the proportion of phosporus in the ore is not too large, Eastern capital will step in, build a railroad from this city to the mines and develop them.

Inyo.

BORAX.—Cor. Inyo *Index*, July 28: The prestige of this section (Alvord) is soon to be restored in the matter of borax shipments. Mr. Shober will leave here with his ten-horse caravan on the 1st of August for the borax fields to load at the works of Conn & Trudo, and Alvord will probably continue to be the main point for shipment from Saline. The news from Sylvania this morning indicates the immediate resumption of operations at the Kinkead claim, the kicks, splits and prolonged song-and-dance having all terminated in putting things in that prominent camp on a basis of sure development. The unvarying statements of the miners and experts as to the richness of the claim will soon be tested by the completion of the furnace and production of bullion.

ORE SHIPMENTS.—Inyo *Independent*, July 25: Shipments of ore from mines at the south end of the county have fallen off considerably the past few weeks. During the hot weather, usual at this season, miners leave the camps and go to the fishing-grounds in the heart of the Sierra mountains or to other resorts for a few weeks' vacation and rest. With the return of cool weather, the usual output of ore will be resumed.

SODA.—All the men that can be got are being put to work at the soda works at Keeler, taking up the new crop of soda. The quantity in the ponds is reported above the average, and the work of gathering will continue several months.

CERRO GORDO.—A promising strike of ore is reported in the Union mine at Cerro Gordo. The ore body has not yet been developed enough to show how extensive it may be. The quality of the ore is of the usual average found in the Union mine.

SYLVANIA. — Inyo *Register*, July 31: Present appearances indicate that the camp's dark days are over. The men have been paid, and all the hands available have been put to work on the furnace. An extension of time has been granted the purchasers in which to make final payment.

Mono.

THE STANDARD CON. MILL. — Bodie *Miner*, July 28: While not yet a matter for general rejoicing, it is still a gratifying fact that the old Standard Con. 20-stamp mill, which has been lying idle so long, was again started up last Wednesday for a short run. Let us pray that it may be for a long run and a prosperous run to the mine and mill owners, for their prosperity means the general prosperity of us all.

Nevada.

ST. JOHN.—*Tidings*, July 29: The St. John's machinery has been started up and has been running smoothly. The buildings and plant have been put up in the most substantial manner. In fact a more workmanlike job it would be hard to find. The pump was to have been started to-day, and in a few days sinking will be commenced.

GREEN MOUNTAIN. — *Tidings*, July 24: The sheriff to-day sold the property of the Green Mountain Consolidated Mining Co., comprising the claim commonly known as the Sanders ledge, in this district, together with improvements, for $675, George G. Allan of Nevada City was the purchaser.

A RIVER CLAIM.—Grass Valley *Union*, July 30: Of late, a number of mining claims has been located on the Yuba river. Just now the river is about "clean" to the bedrock, and there are some very rich deposits along its channel. James Pollard of this place, together with George Treat, T. C. Bourne and others, have located about 2½ miles of the river between the South and North Forks, not far from Bridgeport, and they will ground-sluice the river-bed. The claim embraces about 120 acres, and it is thought to be very rich.

DELHI MINE.—*Tidings*, Aug. 1: Not much has been heard of the Delhi mine of late For several years it has paid handsomely, but the shoot is a small one and has been exhausted in the upper tunnels. A tunnel from near the level of the river is now within a distance of 80 feet of the point where it is expected the ledge will be cut, and is being driven ahead with all expedition. All the indications bear evidence that the ledge goes down and will be cut where expected. When this is accomplished we will again hear of the Delhi's richness.

RIVER MINING.—Next spring and summer will witness lively operations on the Yubas, in the line of river mining. That there are tens of thousands of dollars in the gold in the river washed down from the hydraulic mines during all their years of operations is well known, and now that the beds are scouring out the prospector is on the alert. Rich strikes, such as were made in river mining in the early days, will be heard of during the next year or two, and old miners will, in the days of their physical decay, reap the fortunes that have eluded them throughout the toiling years of their youth and prime.

SEVEN-THIRTY,—Steam was turned on the Seven-Thirty mine plant Thursday evening for the first time and everything worked lovely. Saturday the four-inch pump will commence work, and two weeks hence the boys expect to have some good-looking rock to show their friends. Supt. McSherry informs us that the shaft on the Emmett is now in water, but there is not more than can be easily handled by buckets. The ground is much easier and the ledge has widened out to nearly three feet. Some beautiful ore is coming from the shaft. The Manhattan machinery will be ready to start up some time next week.

Placer.

THE MOORE.—*Herald*, Aug. 2: The *Herald* from time to time has had occasion to refer to the phenomenal richness of the Moore mine, about a mile and a half west of Auburn at the south base of Duncan hill, and owned by Thorpe and the White Bros. Last Saturday Mr. Thorpe brought to Auburn the cleanup from a crushing of 18 tons of ore, 12 tons from the main shaft and six tons from a prospect shaft 300 feet east of the main works. It weighed 266 ounces and 8 pennyweights, and was worth $4300, showing a yield of about $240 per ton. The ore is equally rich in the shafts, 300 feet apart, and at any point between the ledge prospects as well as at the shafts. Thus far they have taken out no rock except in sinking, and they are not very deep, and yet they have realized already a small fortune.

Plumas.

CAPITAL NEEDED.—Cor. Plumas *National*, Aug. 2: The Challen gravel mine is being opened by a company of Minnesota capitalists, with every assurance of having a rich paying mine in the near future. The main channel has already been tapped by a long tunnel, and the prospects obtained fully warrant the company in prosecuting the work. Now, what this county needs, and this section in particular, is capital to open the mines. Here are numerous channels running through the different ridges that overtop the rivers, creeks, gulches, basins and bars that have yielded their millions, and the fountain-heads that fed them comparatively untouched. The resident miners are too poor to run bedrock tunnels, hence the need of capital. There are many good mines in the county that are in successful operation, but this fact is scarcely known outside the limits of the claims.

THE JOHNNY BULL,—Greenville *Bulletin*, Aug. 2: Messrs. Firmstone, Richards & Old are pushing work on the property. The tunnel is now into the hill about 150 feet. The face of the drift is in a nine-foot ledge, which is between well-defined walls and standing at an angle of about 45 degrees. The five-stamp mill is running on ore taken from the tunnel only. Stoping will begin soon. The ore is paying from $6 to $8 per ton. Only six men are required to mine and mill the ore. It is a property that can be operated very cheaply in every respect. The owners have paid for their mill and discharged much other indebtedness incident to developing the mine, and they are now in a position to make money.

THE SAVERCOOL.—From Alex. Cameron, superintendent of the Savercool mine, we learn that work on that property is progressing favorably. The six-foot tunnel is being run in the quartz vein, which prospects well. The large mill is to be repaired and furnished with water-power. In supplying water-power, two propositions are under consideration—one to cut a ditch from Ohio valley and the other to utilize the water in the North Fork below the mill. The company has invited the submission of plans and estimates. The corporation seems well satisfied with the developments made by Supt. Cameron, who now thinks the mill will be running in full blast within six months.

San Diego.

PINE VALLEY.—Cor. Julian *Sentinel*, July 25: Our camp is slowly but surely progressing in the work of development. We are fully satisfied with present developments for the simple reason that the mines invariably improve as depth is attained. Our mines are located on a belt of micaceous and talcose slate, the very nature of which is proof sufficient of the cheapness of extracting the ores. Our ores are, without exception, free milling, gold-bearing quartz, carrying a certain percentage of silver and sulphurets; the veins being well defined, showing good walls on both sides, indicative of true fissures, running northwest and southeast, with a slight dip to the east. The Oxide, usually known as the Wilcox mine, has been opened by a tunnel tapping the vein at 35 feet, showing three feet of good free-milling ore and milling $7 a ton. The Acme shaft is down 30 feet, showing three feet of $8 rock. There are four parallel veins on the location within 60 feet of each other. The Emmeline is opened at a depth of 25 feet, showing a seven-foot vein of $5 rock, which can easily be sorted to $12. A shaft is being sunk on another ledge on this location which is rich in free gold. The vein is from 6 to 18 inches wide, and will average $25 per ton. A pocket was encountered last week showing some very rich specimens of native gold. The above properties are owned by Beam & Kerby. The Columbia, one of a group of mines owned by T. L. Williams, is down 17 feet, a shaft being sunk on a junction of two distinct ledges, which combined measure 4½ feet in width of quartz that will average $11 per ton. There is also a tunnel started to tap the ledge, the face of which is within 15 feet of the ledge. Mr. T. D Los Clarke is engaged in tunneling for the Saddle mine, from which some excellent prospects have been obtained. Noble Bros. & Co. are milling some of the richest quartz in Southern California. It is actually covered with coarse native gold. The ledge averages 15 inches in width. They are also sinking a shaft to tap the Spring mine from which great expectations are entertained, as the quartz in the old shaft has milled somewhere in the hundreds. They also own the Bay View and the Alpine lodes. Goodbody & Co. are tunneling on the vein of the Mollie G. lode, the vein showing signs of improvement both in size and quality of rock. They also own the Gold Bank mine.

GOLD QUEEN.—Julian *Sentinel*, July 25: Supt. Wilkins informs us that the new shaft at the Gold Queen is now down about 50 feet. The hoist will be ready for operation in a month's time. The ten-stamp mill ordered of the Coronado Foundry will be completed in two months.

THE KENTUCK S. — Julian *Sentinel*, July 25: We visited this mine at Banner and met Major Werlitz and Mr. Pannenberg. Work on this property has only been in progress since the 15th day of June. There are three known veins or ledges running through this property, and known as Kentuck S. Nos. 1, 2 and 3. From the dip or angles of these veins a close calculation will bring them together before the 500-foot level is reached. The main working shaft is situated between Nos. 1 and 2 of the veins, is three compartment and is now down to a depth of 60 feet. Two crosscuts are being run, one northeast to cut vein No. 1 and the other southwest to cut Nos. 2 and 3. The work of timbering is the finest we have seen in the camp outside of the great Stonewall. The grading for the engines, boilers, hoist, carpenter and blacksmith shops, ore bins, etc., is about completed. Lower down the hill a tunnel has been started on vein No. 3. In cutting away the mountain and facing up for the tunnel proper required about 30 feet of a level on the ledge. Before ten feet of earth and stone had been cut away they opened out a surprise for all the old-timers. An immense ledge was uncovered showing up free gold. At the face of the tunnel the ledge measured is fully five feet in width. On the dump are 80 tons of a fine quality of low-grade ore that actual tests prove will mill about $18 per ton. No other company has ever come to the camp and accomplished so much in so short a time. This mine is now employing 24 men, two six-horse teams and one four-horse team. Their hoisting plant is on the way from the East and will be put in place as soon as it arrives, as it is badly needed now. As soon as the new road is completed, so lumber can be had, suitable buildings will be erected and teams will be put to work getting in wood and timbers for the winter. In a short time the force of men now employed will be doubled and we may look for lively times around the Kentuck S. before the winter snows come.

San Luis Obispo.

THE CHROME WORKS. — San Luis *Tribune*, July 25: From his recent visit to the soda deposits in the Carrisa Valley, Mr. H. D. Shaw, who is endeavoring to launch the proposed chrome works, returns much strengthened in his conviction that San Luis Obispo is decidedly the place to establish the factory. The deposits he examined are of very great extent and purity and admirably calculated for the uses he desires to make of them. Nothing in fact in the way of crude material is lacking in this immediate vicinity and it can be procured at very low figures, making the great financial success of the enterprise a certainty.

Sierra.

GOLD LAKE DISTRICT.—Grass Valley *Union*, Aug. 2: Theodore H. Wilhelm, Andrew Husom, George Mainhart, Chas. E. Uren, John M. Thomas, all of Grass Valley, and, Charles McCreany of Sacramento, all took a trip up to the Lone Star mine, in Sierra county. The mine is situated in the Gold Lake district, and has been worked enough to demonstrate that it is a valuable piece of property. The ledge in the mine is from three to seven feet in width and can be easily worked. Heretofore shafts were sunk along the line of the ledge, but we are informed that it is the intention of the company to run a tunnel in to tap the ledge. This tunnel will cut the ledge to a depth of about 100 feet. Chas. E. Uren made a survey of the property and the company have applied for a patent. Several large pieces of the ore from the Lone Star, brought down by the party mentioned above, show well in free gold, and are heavy with other mineral containing gold. Mr. Mainhart thinks the prospect at the Lone Star is an exceptionally good one.

NEVADA.

Washoe District.

ORE AND BULLION YIELD.—Virginia *Chronicle*, Aug. 2: This week's ore yield of Comstock mines aggregated 6088 tons, divided as follows: Con. Cal. & Va., 1680, assay value $17.60 per ton; Savage, 446 tons, assay value $25.40; Yellow Jacket, 490, assay value $21.50; Crown Point, 790, assay value $16 99; Justice, 203, assay value $26.63; Alta, 325, assay value $20; Overman, 556, assay value $17; Challar, 463, assay value $25.70; Belcher, 332, assay value $25.94; Ophir, 803, assay value $31. Following was the bullion yield of the ore product from each of the above mines, estimated on the probability that 80 per cent of the value of battery sample ore-pulp assays was returned: Con. Cal. & Va., $23,650; Savage, $10,000; Challar, $9500; Yellow Jacket, $8430; Crown Point, $10,750; Overman, $7560; Alta, $5200; Justice, $4320; Belcher, $8600; Ophir, $20,000. Total, $108,000.

SIERRA NEVADA.—On the 630 level at a point 16 feet from the face of the west crosscut, 600 feet from the shaft station, a north drift is advanced 133 feet continuing in clay and porphyry, showing low assay value.

UNION CON.—On the 1465 level from the north lateral drift, opposite west crosscut No. 4, east crosscut No. 1 is advanced 639 feet, continuing in porphyry carrying clay separations and fine lines of quartz.

MEXICAN.—On the 1465 level, east crosscut No. 1, opposite west crosscut No. 5, is advanced 56 feet, continuing in a porphyry formation carrying low-grade quartz.

OPHIR.—On the 1300 level the winze being sunk below the sill floor of this level, at a point 10 feet southwest of the raise, is down 108 feet, the last eight feet of which includes a north compartment or two sets of timbers. An excavation of the same extent has been made on the west side, making the whole opening the size of four sets of timbers, all of which is in ore. About 50 tons has been extracted therefrom, assaying from $25 to $30 per ton. The ore on the northeast side of the winze appears to be better quality than that on the northwest side. Hoisted during the week 278 tons of ore and shipped to the Morgan mill 803 tons, the average assay value of which was $31.26 per ton. Total ore shipped to the Morgan mill, 883 tons and 1630 pounds. All of this ore will be milled and the bullion returned in three or four days. No more shipments will be made at present.

CON. CAL. & VIRGINIA.—The 1300 and 1500 levels continue to yield the usual quantity of ore. On the 1200 level in the south drift at a point 425 feet south from the Con. Va. shaft, east crosscut No. 1 is advanced 30 feet in porphyry carrying quartz of low assay value. There has been extracted during the week, from all parts of the mine, 1660 tons and 1170 pounds of ore, which was shipped to the Eureka mill, battery sample assays showing an average value of $17.60 per ton (1680 tons milled). Shipped bullion valued at $50,780.88 to the Carson Mint.

SEG. BELCHER.—A winze below the 1300 level,

directly under raise No. 1 above that level, is down 34 feet, the bottom in low-grade quartz.

JUSTICE.—During the week crushed 203 tons of ore showing a value of $26.63 per ton by battery sample assays. The raise above the 460 level is up 57 feet; top in fair milling ore.

ALTA.—The ore output this week was 325 tons, showing an average assay value of $20 per ton by pulp assays.

OVERMAN.—Shipped 556 tons of ore during the week showing an average value of $17 per ton by battery sample assays, of which $9 62 was gold. Are stoping ore from the incline winze below the 1200 level. The 850 level south lateral drift is out 41 feet; the face in vein matter.

OCCIDENTAL CON.—Continue to extract ore of fair quality from the stopes on the 400 and 450 levels.

BEST & BELCHER.—On the 1200 level west crosscut No. 1 is extended 114 feet. Formation, clay and porphyry with some quartz.

GOULD & CURRY.—On the 400 level the northwest drift is extended 231 feet. Formation, soft porphyry.

SAVAGE.—Shipped 490 tons of ore, showing an average value of $25.40 by battery sample assays. Extracting ore from the 300 to the 1300 level. Bullion on hand valued at $28,518.80.

ANDES.—The 350 level west crosscut is stopped.

HALE & NORCROSS.—Shipped on July account 2325 tons of ore, which has yielded $36,700 in bullion.

WARD COMBINATION SHAFT.—The 1800 level east drift is advanced 460 feet and the west 470. Both continue in porphyry.

CHOLLAR.—Extracted 463 tons of ore battery sample assays showing a value of $25.70 per ton. The 850 level east crosscut No. 2 is in 128 feet; face in quartz and porphyry.

POTOSI.—The incline winze is down 284 feet below the 930 level; bottom in porphyry, with streaks of quartz giving fair assays.

ALPHA.—The 600 level east crosscut No. 2 is in 90 feet from the shaft, the face in clay and quartz. The 600 level southwest crosscut is in 112 feet, face in clay and porphyry.

EXCHEQUER.—The 600 level north lateral drift is in porphyry.

CON. NEW YORK.—The 800 level north drift from west crosscut No. 1 is out 137 feet; face in clay and porphyry.

IMPERIAL.—The 1000 level west crosscut No. 1 is in 210 feet, the face in quartz and porphyry.

YELLOW JACKET.—Shipped 490 tons of ore showing average assay value of $21.50 by battery sample assays. East crosscut No. 2, 100 feet south of No. 1, will reach the vein next week.

CROWN POINT.—Shipped during the week 761 tons of ore, showing an average value of $16 99 per ton by pulp assays. The pay ore in the 300 level west stope is yielding as usual, and that in the east stope is growing narrower.

CONFIDENCE & CHALLENGE. — Joint Imperial west crosscut No. 2, 450 level, is in 276 feet, face in barren quartz. The joint Imperial north lateral drift is out 450 feet, face in porphyry.

Ely District.

THE CHAINMAN MINE. — White Pine *News*, July 28: The property of the Ely Mill & Mining Co. (W. G. Lyons, James McOmie, A. J. Underhill and W. N. McGill) has recently shown great improvement in the grade of the ore. They are now down 250 feet in ore that goes $200 in gold to the ton. The ore is baser than near the surface and may require roasting or smelting to treat it successfully. The work of development is going on and the mine is responding nobly to the labor done upon it,

White Pine District.

ACTIVITY.—White Pine *News*, July 28: In an interview with E. Shepardson of Hamilton, a few days ago, we learned that the mining prospects of that district are very bright just now. The following mining items of interest we give from his interview: Sam Paul has made a very important discovery near the summit of White Pine mountain lately. The ore goes 100 ounces in silver and 66 per cent in lead. The vein is large and promises to develop into a big mine. J. R. Kendall and George Allen are taking out very rich ore from the Alceon mine, just above Hamilton, and shipping it to Salt Lake. George Paul's mine, on the other side of the divide on the road leading to Shermantown, is showing up fine. Two men are taking out more ore than a 12-horse team can haul to Eureka, and it is of good grade. A. Jacobson, Gus Simon, Rocco Kranez and P. Peterson are taking out good ore from their mine on the western base of Treasure Hill. Tom Cornell has a good mine at the base of White Pine mountain, leased to Dave Ross, Tom Waters, Ed. Daily and Wm. Roberts, near McAllen's mine. The boys are taking out good ore and making money. A. Muir and John Brown are working the Elko mine on the east side of Treasure Hill, and are shipping ore. But, undoubtedly, the best mine in the district is that of McAllen Bros., at the eastern base of White Pine mountain. They will take out $10,000 this season and have a property worth $100,000

COLORADO.

SNOW MASS COPPER.—Aspen *Times*, July 26: There is a prospect of the Snow Mass copper properties being extensively worked in the near future. The copper ore that has been found there in the past has all been float, but it is such a regular form that the belief is entertained that the lode from which it comes is not far distant. The plan now is to thoroughly prospect the ground above for the purpose of finding the ore in place. The ore is very rich in copper, selected specimens running as high as 65 per cent. It all carries silver, the assays returning as much as 40 ounces in some cases, and the average appearing to be something like 15 to 20 ounces. The work that has been done has all been done in the broken ground where the mineral is met with.

BONNYBEL DUMP.—The dump of the Bonnybel is proving to be very valuable. It is under lease to Dan Santry, Fitzpatrick and others, and they are shipping quite heavily from it. They ship the ore to Leadville and are able to clear about $5 per ton on it. The dump is believed to contain fully 5000 tons of stuff that will pay to ship, and the lessees will realize quite handsomely from it.

A TIN CUP MINE.—The Jimmy Mack and Mary Meagher mines at Tin Cup, owned by the Brunswick M. & M. Co., are developing into a paying property under the management of J. S. Halsey. The property had been idle for 18 months, but work was recently started up on it again. There was a four-inch streak showing when Mr. Halsey began operations, but the vein has now opened out to a width of seven feet, 18 inches of which is solid ore that runs up over 100 ounces.

ARIZONA.

A BOND.—Prescott *Journal-Miner*, Aug. 3: W. U. Masters and W. H. Storms have taken a working bond, with privilege of purchase, on the Ohio mine, owned by Wm. Jennings, nine miles from town, and have placed a number of men at work developing the property. The mine has yielded some splendid ore. Mr. Pedley is pushing work on the Lynx creek hydraulic works. About 30 men are now employed on the dam, which has been built 15 feet high above bedrock. The dam is being built of masonry, and will be perfectly solid. Work is also progressing on the ditch. The new shaft of the Senator is now down 430 feet. A station is being cut out on the 420-foot level. A very large body of high-grade sulphurets was recently struck in the north drift, similar in character to the ore previously encountered in the south drift. The Wire Gold mill continues to pound away on ore from the Wire Gold mine. The Tuscumbia mill will be started up soon again. J. D. Helm expects to put the old Tiger mill in operation soon. Walter J. Wright will be in charge of the Tuscumbia mill when it starts. The Senator shaft is now down 450 feet. Mechanics are at work putting up roasters in Copper Basin, and that camp promises to be lively once more.

IDAHO.

STRUCK IT RICH.—Idaho *Avalanche*, July 26; Ike Phillips came down from the Phillips & Sullivan mine on Sunday evening, bringing the news that he had struck it rich. In running the lower drift south they have at length reached the chute of ore out of which, nearer the surface, the lessees of the mine a year ago had taken $20,000 in $150 ore. This chute has widened out to over three feet and is not only apparently much richer in silver than where worked above, but carries a much larger percentage of gold. Several parties have been up to see the new find during the week, and all pronounce it the richest they have ever seen on Florida mountain. Estimates place the value of the ore all the way from $300 to $1000 per ton. A drift has now been run on the chute a distance of 30 feet without any signs of its diminishing in value. As the drift is 123 feet below where work was stopped on it in the upper level, enough of this rich ore is now in sight to safely pronounce it a fortune for the lucky owners.

THE ONTARIO AND SUNOAY MINES.—Ketchum *Keystone*, July 28: We have been shown a dispatch from Major W. A. Rooks, general superintendent of the Ontario group and of the Warm Springs Mining Co., addressed to Mr. Milt Mourning instructing him to put men at work immediately on the mines of the company. This will give new life to this section of the country. The mines belonging to this company are the Ontario, Hub, Huh No. 2, Niagara, Hathaway, Old Abe and Sunday. Operations are likely to commence first on the Ontario and the Sunday. There is a great deal of tunneling.

THE PHILADELPHIA & IDAHO CO. — Wood River *Times*, July 31: It was rumored in town, yesterday, that operations would soon be resumed at the Ketchum smelting works, This rumor, the *Times* is prepared to state, was founded on fact. A letter of instruction ordered Mr. Hardess to increase the forces at work on the North Star and American Eagle group on East Fork and the Silver Star group in Smoky. Mr. Hardess was also instructed to appoint heads of departments or divisions of the calcining and smelting works. The "blowing in" of the company's furnaces will mean a great deal to Wood River. It will mean the employment of between 300 and 400 additional miners, teamsters, haulers, furnace-men, etc., and a revivifying of all our small industries.

ANOTHER CAMAS BRICK.—A $1200 gold brick was brought in yesterday from the Camas No. 2 mine and mill.

NEW MEXICO.

HILLSBORO.—Rio Grande *Republican*, July 26: The Garfield, Golden Era, etc., are developing and producing ore. The 85 is proving to be a good mine (C. K. Co.) and will soon add its share to the output of the camp. There are many excellent prospects in the camp that can be made producing mines, only needing a small outlay of capital. The Opportunity, Snake and Bobtail are all working and keep pounding away day and night on their ore, with their 20-stamp mill at Hillsboro. J. H. C. has commenced development in earnest on his Black Peak mines and expects within three months to be sending out gold bullion bars from the camp. Mamie Richmond, a steady producer of high-grade ore, recently sold for $6000 to Chicago parties, will now be more extensively developed. The Bonanza and Hope mines are working all the men that they can, conveniently. They are working their ore at their own mill, two miles from Hillsboro, (a five-foot Huntington mill and concentrator,) capacity, 20 tons in 24 hours.

KINGSTON.—Word has reached here from Kingston that the vein which was the source of the rich float found on the Solitaire mining claim has at last been found. Nine years ago a prospector discovered a lot of ore on the surface of this claim which was nearly solid silver, and $80,000 was picked up in one week, but all efforts to discover the vein proved futile until now a miner named Edward Coffey has opened a true fissure vein of sulphide of silver near this property which shows the richest ore ever produced in the camp, and is thought to be the "feeder" which furnished the solitaire ore. Fabulous stories are told of the value of the ore in sight.

MONTANA.

THE MINES OF ORO FINO.—Helena *Journal*, July 26: A Helena gentleman just returned from Oro Fino district, Deer Lodge county, informs the *Journal* that the mines of Champion give every indication of developing into permanent and rich producers. The latest strike, he says, was made on the Silver Crown's 100. The crosscut has reached the footwall, exposing 25 feet of vein matter, eight feet of which is solid quartz thickly interspersed with rich ore. The Champion's recently reported strike on the 500 is confirmed, five feet of good ore having been opened up. The Keystone Co. left good ore in the Washington at a depth of 135 feet, in order to go deeper. A crosscut will be run at the 200, which will undoubtedly open into good ore. The American-Ruby is going for the 350 with all possible speed. Every one prominently concerned in Champion properties is now thoroughly convinced that the Ore Finn is a deep country; that only depth is required to prove up one of the richest and most permanent districts in the State.

THE TOSTON SMELTER.—It is stated that the Toston smelter, at Townsend, which has been shut down by its recent purchasers, is soon to start again under a different management.

WILL INCORPORATE.—A movement is on foot among a syndicate of Helena mining men to incorporate a company to develop a group of valuable silver-copper properties in the vicinity of Radersburg, Jefferson county. The claims are known as the Silver Reef group, and consist of three locations, the Silver Reef, Henry and Green Copper.

THE HIAWATHA.—The permanent working shaft on the Hiawatha has reached a depth of 60 feet and will be pushed as rapidly as possible until the 225 is reached. At that point the workings will be near the lead, which can be tapped by a short crosscut. Most gratifying returns were received from a carload of first-class ore shipped last week, and the management feels greatly encouraged by the present outlook.

UTAH.

MOUNT BALDY MINES.—Salt Lake *Tribune*, July 26: Chas. Crane has been working some claims on Baldy mountain, in Gold Mountain district, about 30 miles from Beaver City. He owns the C. C. & D. mine, in which they have run a tunnel 40 feet on the vein. This vein is six feet wide, with a pay streak about two feet wide. Sixteen samples were taken across the vein and assayed separately, showing values from $26 up to $2760 per ton. Yesterday Mr. Crane received a letter from home saying that his men had struck some ore which is richer than any yet seen in the mine. The letter also gave information that the Sevier mine has been sold for $200,000. The Sevier is an extension of the C. C. & D.

THE ANCHOR BORE.—At the Anchor mine, Park City, a hole is being drilled down from the bottom of the shaft to the tunnel for the purpose of draining the mine. The distance between is about 600 feet; of this, nearly 400 feet has been cut.

SAMPLES.—Salt Lake *Journal*, July 26: Inquiry at our assay offices develops the fact that more samples of ore for assay and analysis are being received now than ever before. They are sent from every portion of the Territory, and represent new finds as well as abandoned tunnels and shafts.

EUREKA.—J. A. Van Pelt and G. E. Norton of Van Pelt, Norton & Harris of this city returned Thursday from Eureka, bringing with them samples from the Anor mine which assayed 75.8 ounces silver, 1.2 ounces gold and 4.6 per cent lead. The Anor adjoins the Mormon Chief on the north and the Sunbeam on the west. These gentlemen have control of this property, and are greatly elated over the prospects of the mine. Van Buskirk & Stebbins have recently closed a deal whereby they have obtained control of six claims in Eureka that are on a continuation of the vein tapped by the Bullion-Beck, Eureka Hill and Centennial-Eureka. Work will be commenced immediately on these claims, and the owners believe that they will develop into mines equal to any dividend-payer in that camp. Mr. Stebbins will go to Eureka next week. Capitalists and mine-operators are pouring into the Tintic district at an astonishing rate, and a great many new locations are being made there.

WASHINGTON.

AN EXCITEMENT.—Cor. Washington *Farmer*, July 28: The excitement up at the fork of the Cascade river—18 miles from this point, where that river empties into the Skagit and along the north fork of that river for 20 miles, including the Boston and Buffalo mines, on the summit of the mountain—where the Rouse Bros. have struck it so rich, is growing hourly. New finds of very rich silver ore assay from 60 to 65 ounces of silver to the ton, and lead from 60 to 65 per cent. The gold finds up to this date do not show over ten ounces of gold to the ton. Prospectors are pushing in every day from Ellensburg and Spokane, via Chelan lake, besides the parties who are keeping the road from Hamilton, Sedro, Anacortes and other points, in commotion en route to the mining fields. The people on the other side of the mountains along the Columbia river and about Spokane are much more excited over the silver finds about the summit than our people are on this side.

THE KOOTENAI MINES.—Spokane Falls *Chronicle*, July 26: Hon. J. B. Sargent returned this morning from an extended trip to the Kootenai mines. "We found the mines in splendid condition," said Mr. Sargent. "They are working them to advantage, too. The Silver King, Bonanza and Poorman mines are all turning out good ore and large quantities of it. All of the old mines are doing well and there are a number of prospects that promise good returns. In the Silver King they have struck a rich and solid vein of ore 12 feet across. In the Nelson district there is a new mine called the Tough Nut that promises wonderful things. They have struck a fissure of ore that promises to last as long as they care to work it. It is a very rich ore, too. New prospects are being opened right along and they are all doing well. Their greatest drawback at present is transportation, but that difficulty will probably be remedied in a very short time. The Northern Pacific and the Great Northern are both building into the district as fast as possible. As soon as the roads get in there the capitalists are expected to build a first-class smelter—nothing less than a 300-stamp mill and one that can work all kinds of ore. They figure that they can save the miners $6 per ton, the cost of shipping it to Spokane Falls. Lord Boyle and Dr. Campbell were looking over the mines while we were there and purchased two good mines, or rather one mine and a prospect. They paid a good price in cash for both, and as a consequence the mines throughout the district took quite a boom."

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 29, 1890.

433,116.—GRADING SCRAPER — L. E. Ashley, Stockton, Cal.

433,193.—WHEEL—Daniel Best, San Leandro, Cal.

433,072.—VALVE AND FAUCET—A. H. Dauchy, San Diego, Cal.

433,198.—VALVE AND FAUCET—A. H. Dauchy, San Diego, Cal.

433 165.—WATER-CURRENT MOTOR—Geo. R. Diggs, S. F.

433 201.—DIE FOR CUTTING METAL SCREWS—Geo. Gibbs, S. F.

433.172.—BICYCLE—John Jett, S. F.

433,173.—VELOCIPEDE—John Jett, Glen Blair, Cal.

433,130. — PRESSER FOOT FOR SEWING MACHINES—Crapo Leak, S. F.

433,131.—AGING WINE—Geo. H. Malter, S. F.

433,133.—WASHING MACHINE—E. McDonald, Willow, Cal.

433,305.—CAR COUPLING—W. Portlock, San Diego, Cal.

433,216.—ELECTRIC TRAIN SIGNAL — A. W. Reppy, Oakland, Cal.

433,098.—COMBINATION TOOL—T. P. Schwartz, Stockton, Cal.

433,104.—FEED-WATER HEATER—A. R. Smith, S. F.

433,110.—GAME—Dormer Walsh, S. F.

The following brief list by telegraph, for Aug. 5, will appear more complete on receipt of mail advices:

California—Alexander Johnson, Oakland, assignor to Marshall Improved Furniture Co., San Francisco, sash balance; Almon Ames, assignor to R. J. Davis, San Francisco, pile covering; Charles L. Burbeck, Fort Bragg, oil cup; Alvin T. Church, East Oakland, sash holder; Gertie D. Cluff, Lodi, garment supporter; Gilbert A. Cunningham, San Francisco, safety guard for railways; Samuel H. and C. L. Miller, Stockton, bay press; George W. Parker, San Francisco, street pavement; Assaria Rewrick, San Francisco, traveling block; Charles Silberstein and J. Amos, Los Angeles, smoothing iron; Clara Turney, Sausalito, horse-controlling device; William A. Zumwalt, Farmington, gang plow and harrow.

Oregon—Frank Batter, assignor of one-half to L. Clemensen, Marshfield, device for drawing beer; Richmond P. Smith, assignor of one-half to T. G. Owen, Marshfield, tool for manipulating insertible saw teeth.

Washington — Emma C. Hudson, Seattle, slate sponge.

Arizona—Thomas J. Thorp, Chicago, Ill., assignor of three-fourths to D. J. Brannen, Flagstaff, and G. M. Lockwood, Washington, D. C., wheel.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

AUTOMATIC ELECTRIC TRAIN SIGNAL.—Albert W. Reppy, Oakland, assignor of one-half to T. C. Masteller. No. 433,216. Dated July 29, 1890. This invention relates to that class of train-signaling apparatus in which a normally closed electric main current is employed in connection with one or more local circuits in the several cars and engines of the train, said local circuits, including an alarm, being normally inoperative or open but adapted to be closed and brought into action by the breaking or opening from any cause of the main circuit. The object of this invention is to provide a simple and effective apparatus of this class adapted to be called into action in any possible contingency, particularly upon the breakage of any portion of the train, the derailment of any of its wheels, or the will of any passenger, train-man or engineer.

SPRING PRESSER-FOOT FOR SEWING MACHINES. Crapo Leak, S. F., assignor of three-fourths to Mondula Leak and D. V. B. Henarie. No. 433,130. Dated July 29, 1890. This invention relates to certain improvements in presser-feet for sewing machines. The advantage of the device is very great, especially in sewing kid, leather, cloth, or goods of any description where seams lap or varying thicknesses of material occur in the line of stitching.

WHEEL.—Daniel Best, San Leandro. No. 433,193. Dated July 29, 1890. This invention relates generally to the class of vehicle wheels, and especially to those wheels which are to be used with very heavy vehicles, such as traction engines or road locomotives and other heavy implements. The object of the invention is to provide a construction which will permit the ready attachment of the spokes to the hubs and their removal therefrom when necessary.

GAME.—Dormer Walsh, S. F., assignor to F. H. Manker. No. 433,110. Dated July 29, 1890. This game or toy consists of an inclosed table having a smaller movable table fixed in it with the upper surface flush with that of the main table, a means for giving an impulse to the movable table and a series of marked or numbered pieces which are assembled upon the moving table and afterward projected therefrom, and an opening in the main table designed to receive some one of the marked disks which are projected from the movable table and to expose the number or mark thereon. Various games may be played with this device, the object being in each case to scatter the movable disks about the surface of the main table and to place one of them within the observation opening.

PROCESS OF AGING WINE.—Geo. H. Malter, S. F. No. 433,131. Dated July 29, 1890. This is a peculiar method of aging wine, by which the valuable aromatic and delicate flavors from wine vapors are introduced into the wine being aged.

MECHANICAL PROGRESS.

COMPOUND LOCOMOTIVES IN GERMANY.—Mr. Stsmhke of Berlin read a pspsr in Janusry last in which he gavs the rssults obtalnsd with ompound engines hy the varlous State railway boards of Germany. On Decembsr 1, 1889, thsrs were running 118 compound locomotives, and 87 wers on order. Of ths 205, 16 were express, 35 passengsr, 139 freight, and 15 tank engines. The Bromberg State railway bosrd, employing 74 of thess locomotives, reports that the coal consumption avsrages 12 per cent less thsn ths ordinary engins. The cost of ths compound is ahont $350 mors thsn of the standard engine, hnt ths cost of rspairs is no hsavier. This hoard strongly rscommends the adoption of compound frsight engines. Ths Hanover hoard, wlth 89 compound locomotives, rsports that failures in starting are not more numerous with compound than with ordinary locomotives. Ths steam snpply is always smple, and ths tractive power is grsstsr than thst of the standard. The prsmium for economy of coal consnmsd earned hy ths drivers of the compound is always higher than that sarned hy the drivers of ordinary locomotives, althongh a deduction of 5 per cent is made against the compound. The amount of spsrks thrown out of ths chimney is less than with ths standard locomotive. The Hanover-Cassel traffic office recommends that in future only compound engins should hs ordered. The Frankfort-on-Msin board reports a fuel-saving of 17 per cent in ths Nordhausen district and 18 per cent in ths Frankfort. The oompound runs steadily at the greatest speed allowed. The Magdehnrg hoard rsports that enginss engaged in a variety of work show only three to six per cent economy of fuel; the compound freight engines drawing heavy loads over long distances, from 15 to 20 psr cent economy.

BAND SAW FOR METALS.—English mechanics are said to depend much upon a tool whioh is bnt littls ussd ln America, namely, a band saw for metals. Its construction, as described, is similar to that of a heavy hand saw, with a third carrying whssl for the saw, the object of this being to remove ths up-moving side of ths hlads from the vicinity of the tahls, and thus leave a dssp throat through which a largs piece of work can bs passed or a wide plate turned. Ths third whssl is placed at the hack of the machins, ahont midway in the vertical hight of ths saw blads. The tempsr of the saw is slightly harder than that of thoss nsed for wood, and the tssth ars sharpened straight aoross the hlade hy a cutter with its tssth at the right hight to suit the teeth of the saw blads. This tool is ussd for cutting off the spines from stesl castings, ths snds of holts, to saw up steel, iron and copper plates to any form, and to rough out the jaws of sccentric rods and other forgings whioh would require ths nse of slotting machinse, and it cuts as well on s circle as npon a straight lins. The blads is lubricatsd with soap and watsr, and in a cut six inchss long throngh a steel connecting-rod jaw it works frsely and sstisfactorily. Not infrequently oirculsr saws of large dimensions are used for the same purpose, and, heing mounted on hsavy frames and fsd carefully up to thsir work, cnt off largs pieces of stsel, leaving nearly a smooth surfaos on the face of the cnt.

SAVING OF DEAD WEIGHT BY USE OF STEEL.—While looking over the exhihits of stsel plates for car construction at the O.d Point Comfort Convention, we were struck with the saving in dead weight already accomplished by the nse of steel center plates and stake pockets. At our request Schoen Mannfacturing Co. prepared for ns the following statement showing the approximate ssving in dead welght and cost hy ths use of pressed centsr plates and stake pockets on 4000 oars, built hy the Philadslphia & Reading railroad:

Saving in dead weight per car, by using pressed steel center plates and stake pockets, pounds	548
Average mileage per annum per car, miles	8,000

Five hundred and forty-elght pounds dead weight moved 8000 miles, eqnals 2192 tons moved one mile at $ 0426 per ton mile; this equals $9327 per car per annnm. Assuming that to he the cost for moving paying freight, one-half of this would he the cost of a non-paying load, as tho weight of the car ahout equals the average load hauled; this would he $4663 psr car per annum as the cost of moving the extra welght of oast iron center plates and stake pockets. On 4000 cars it would amount to the total of $18,652 per annnm. Taking 12 yeare as the average life of these cars, this would make the total sum of $223,824 savsd by the substituting steel for cast iron.—*National Car and Locomotive Builder.*

DISCOVERY OF NOVEL PROPERTIES IN CAST IRON.—Some specimens of oast iron which exhihit nnusnal properties, produced at one of the great stove manufactories in Alhany, New York, have excited much interest; the pieces of metal being about one inch in width, one-elghth inch in thickness, and some 15 or 18 inches in ength. Of these strips, some were twisted so as to form spirals, and others were wrapped upon coils. That oast Iron can be made very tongh, and even a certain amount of elastioity he imparted to it, is of course well known, hnt it ia nnusual, if not nnprecedented, for any metal employsd in stove foundries to hear such tests as those thns indicatsd. The twlsting and hending in this case were done hot, there being nothing ln ths specimens hnt a jndicions admixture of good irons and the absence of old scrap —ths fact heing also stated that the irons in qnestion represent the daily meltings of the foundry from which they came, all the stoves produced there having their plates of the same metal which exhibits this pecullar toughness. It is not asserted that, because the metsl will hear a torsional strain of ths kind described, lt is, thsrefors, unbreskable, thsrs bsing, of course, a limit to its remarkahls elasticity.

AMERICAN STOVES.—Ths *Engineering and Mining Journal* has this hint to Amsrican stove and furnace maksrs: For soms ysars past Amsrican stoves and furnaoss have enjoyed a wids popnlsrity on the continent of Europs. Their gracsful constrnotion, effectiveness as fnsl sconomizers, and low cost, havs specially captured the thrifty German people. Amsrican-made stoves, certainly superior to the English and Irish-made stoves, have undersold them in ths German markets, msinly hecanse of the superior facilties and contrivances adoptsd in mannfaotnre in this country. But the German objects to importing what he can make himself. Stove factories ars, therefors, springing np all over, and mors sspecially in the vicinity of Mannheim, whers so-called "Amsrican stoves" are hsing turned ont rapidly. The rssult of this has alrsady appreciably affected the exportation of Amsrican stoves to Germsny; and it may hs dspended upon that, as soon as the Germans perfect their mechanism and methods, and with cheap labor, thsy will hecoms formidahle competitors in our outside markets. In all ths repnhlios of South Amsrica, more especially, the Germans are now pnshing their producte, and in soms osses thsy ars even crowding ths English. As our Teuton competitors waste little time in commercial matters, it hehoovss American stove mannfacturers to watch their South Amsricsn markets. Eternal vigilanos and goaheaditivenesa are ths prios of commsrcial snpremacy.

MECHANICS AS INVENTORS.—Said Sir John Lubhock rscently in a lectnre to English workmen: "It is remarkahle how many of the improvsments to which wsowe ths marvelons development of our manufacturing industry have heen dne to workingmsn. Watt was a mschanical engineer; Henry Cort, whose improvements in mannfactnres were said to have added more to the wealth of Englsnd than the whole valne of the national deht, was the son of a hriok-maker; Hnntsman, the inventor of oast stsel, was a poor watchmaker; Crompton was a weaver; Wedgewood was a potter; Brindley, Telford, Mashat and Neilson wsre workingmen; Georgs Stephenson hgan life as a cowhoy at twopence a day, and could not read till he was eightesn; Dalton waa ths son of a poor weaver; Faraday of a blacksmith; Nswoomen of a hlacksmith; Arkwright hegan life as a barber; Sir H. Davy was an apothecary's apprentice; and Boulton, the 'father of Birmingham,' was a hntton maker. To thsse men, and others liks them, the world owes a deep debt of gratitnds. Ws onght to hs as proud of tbem as of any of our generals or statesmen."

A SPRING PROPELLED VEHICLE.—In ths rsoe for new and improved msans for propulsion, such as stsam, gas, foot and crank powsr, no ons ssems to have thought of ths conservatives energy of a coiled spring until a Sonth Carolina lnventor devsloped the idea, and appeared, throngh his attorney, at Washington, for a patent for the same. The fundamental idsa seems to he the attainment of a road vehiole to take the plsce of the velocipede and for other pnrposes. The idea may he applied to one or more wheels. The devioe is so arranged that when the traveler is descending a hill the gravity force is utilized in winding up the spring, so that snch energy may be expsnded in conveying the occnpant over the adjoining plain and in mounting the next inoline. A ratchst levsr is also attachsd, to add to the spring tension as it is expended in keeping up the onward movemsnt. A singls spring or series of springs may he nsed.

GOVERNMENT TESTS OF ALUMINUM BRONZE.—At the Arsenal in Watertown, Mass., recently a serles of tests were made hy Government officials to determine ths tensile and transverss strength, dnotility, elasticity, and compressional strength of aluminnm hronze. Bronze will enter very largely into the construction of the new Government gunhoats, and these tests are of great importanoe, inasmnch as alumlnum hronzs can be prodnced at less cost than manganese bronze, which is nsed at present. These tests were of the tensile and transverse strength only, and they were far more sstisfactory than had besn expected. The tensile strength was shown to he over 90,000 ponnds to the sqnare inch, whioh was largely in excess of anything ever before shown. The transverse strength developed was 6600 pounds on a one inch sqnare bar. This has not heen equaled hy any other metal, except the finest quality of orncible steel.

AMERICAN SCISSORS IN SHEFFIELD.—A trade whioh nt one time was regarded as one of the dying industries is again reviving rapidly—that in soissors. German competition, says the London *Engineer*, has heen excessively keen in scissors for domeatio use, particularly those in the cheaper qualitiss. The Americans heat hoth English and German of the tallors' soissors, which are perhaps the most important hranoh. Amerioan-made tailore' scissors are prsferred even in Sheffield.

SCIENTIFIC PROGRESS.

Tanning by Electricity.

We hsve severs l times alluded, in these colnmns, to the experiments in tanning by electricity which have lately hesn carried on hy an Englishman. Ths inventor has qnite rscently made some demonstrations on a commercial scale which hsvs elicited much interest.

It appears from the rsport of these experiments, as presented to the puhlio, that hy this invention slectricity is used simply to shorten the time reqnired hy ths usual process, and that lt possesass no other advantage. Why or how it rednoes the time, neither the inventor nor any ons slse has hesn ahle to show. Rscent experiments made in France have shown that when plant seeds ars snhjected to ths action of an electrio current, presisely in the same manner as the skins are snhjected to it, a similar rssnlt sppsars—that is, the sseds come forward much more rspidly and produce fruit decidedly superior to that obtained without ths nse of electricity. This is ons of the most rscently discovered mysteries of this most mysterious agent.

The chsmistry of tanning has long hesn perfectly nnderstood, and ths ssme chemical agenciss ars required whsn electricity is employed as when the process is condncted in the usual manner.

If we plaos soms gelatine in a test tuhs and sdd a little tannio acid, the gslatine will gradnslly becoms coagulated. Ths hides of animals are full of gelatine, and when thsss hides ars divested of hair and placed in a solution of the tannio aold obtained from nntgalls, oak bark, or from any othsr source, the gslatine in the hids is coagnlated, thns rendering it hard and dnrahle—the hids is converted into leather.

This nsw process, if rsports concerning it are true, seems to warrant the conclusion that it will work a great revolution in the important indnstry of tanning.

Ths leading fact to hs notioed in the metter is that it does not supersede ths present uss of tannic acid—it only shortens ths time required for its action. By the ordinary method, ahont two months are required to thoronghly coagnlate the gslatine, or oonvert the hids into leather; while, acoording to reports, the same rssnlt may he obtained by the additional aid of electricity in four daya. This shortening of time grsatly rednces the capital necessary to he employed, or rather turns over ths capital in about ons-tenth of ths time.

To do this, however, power is rsquired. In the present process the hides ars allowed to rest quietly in ths vats soms two months; while in the nse of slectricity the hides are placed in a revolving drum. Ths ons used in the experiment at Bermondsey was made of wood, 12 feet in diamster, 8 feet long, and rotated at 8 rsvolutions a minute. Turpentine and tannic acid were used to saturate ths hides, and a strong current of slectricity was oansed to flow through the liquid in the drnm hy msans of a metal hand which ran aronnd the interior of ons end to a corresponding hand on ths other end. We are not told how mnch power is required to rotate ths drum, or what would hs ths cost of keeping up the constant strong onrrent of slectricity.

Ths leather turned ont hy this expariment was prononnosd to he of excellent quality, and lt may reasonably he supposed that the extra cost for power and electrioity would he more than connterhalanced hy the sconomy of space and time secnred.

In Aid of Science.

Prof. Davidson of the Coast and Geodetic Survey is now at the summit of Monnt Conness with his equatorial telsscope and other instrnments necessary for taking observations for the great triangulation survey of the Unlted States that is heing continued from summer to summer. The triangulation of the Atlantio and Gulf Coast is nearly completed, hut the Pacific Coast will still take several years. The ohservations are taken only from the tops of high peaks, and when finished and compared with the position of the stars will furnish an absolntely accurate survey of the coast countries.

The work of triangulation, says the *Call* of thie city, is interesting and curious. Prof. Davidson and his assistants are stationed on the top of Mt. Conness with their instrnments. Off to the west, on the top of Mt. Diahlo, are stationed two men with an instrument called a heliograph, which is an ingenious arrangement of a piece of looking-glass which flashes the sun's rays through two round hrass rings.

This instrnment is sighted for the top of Mt. Conness, hnt as the big mountain cannot hs seen from Mt. Diablo the sighting has to be done by a delicate instrument, which determines its place aconrately. Every day, from sunrise until 10 o'clock in the mornlng, and from noon to l o'clock, and again from 3 o'clock ln the afternoon until sunset, these two men take turns at handling this mirror hy a clever arrangement of screws, whioh hold the glass at snoh an angle as to flash the sun'a rays through the two hrass rings and straight into Prof. Davidson's Instrnments on the top of Mt. Conness, 100 miles away.

A similar contrivance ls placed on Mt. Macho, to the south of Diahlo, and this is also tended hy two men. To the aouthwest of Mt. Conness is Round Top, whioh also has its little flashing machine; so, too, has Mt. Grant, away over in Nevada and northeast of the central point, and so also has Lone Mountain, situated in the heart of the Nevada desert and due east of Connsss. In the centar of all thsse converging rays of light is staticned Prof. Davidson, making his obsarvations and calculatione, and oorrecting the rsnlts at night hy ths positions of the stars.

HOW WE LOOK AT THINGS.—Prof. G. T. Patrick in *Science Monthly* says: "You and I see svsrything, to some extent, differently. You see things from the standpoint of your prsviously acquired groups of idsss; I from mine. Strictly, no two persons can ass the sams thing in the sams way, for it can never happen that two persons have preoisely the sams gronps of ideas rslating to any snhject. These depend on our past exparience, on our edncation, on ths heliefs of our times, on our various sects or parties, on our pet thsories, our intersats, and our desires. Here is a simple illnstration: Suppose an artist and an engineer, standing side by side overlooking a tract of country. What they perceive is the ssme; what they apperceive is wholly different. To the engineer the country presents itself as a possihle line for a railroad, with hare advantageous gradss, and thsre economic hridges. Before the artist is spread ont a landscape, with light and shade and harmony of oolors. Suppose, again, a plot of level gronnd in ths suhurhs of a city. A college student, riding hy, apperceives it as a possihle hall ground; a young girl, as a tennis court; a speculator, as an addition to town lots; an undertaker, perhaps, as a possihle site for a cemetery."

A CURIOUS PHENOMENON.—When the snn sets in the sea, a cnrious appsarance, as of a hlnish-green flame, is sometimes observed. This has heen thonght to be dne to the light passing through the crests of waves. But Prof. Sohncke oonsiders this view disproved hy such an observation as that recently made hy Prof. Langs, at a watering-plaoe on ths Baltic. Shortly hefors sunset the disk was dividsd in two hy a thin strip of cloud, and just as the upper part disappeared under the cloud, the hlne flame was obsarved. Thus the cause appears to be in the air, not in the sea. It is a oass of atmospheric refraction. And as a planst, seen near the horizon with a good telescope, appears drawn out into a spectrum, with the more refracted hlue-violet end higher than the red, so the last visihle part of the snn furnishes the hlue-violet end of a spectrum.

A SUNKEN MOUNTAIN.—It is rsported apparently upon good authority that a mountain peak, nearly 1000 fset high, in the Coast Range of Oregon has recently disappeared, or as the discoverers, a party of hnntera, express it, "the mountain is now an island, as lt were, surrounded hy an almost perpendicular wall of rock ahout 100 fset in hight." The noise made hy the sodden sinking of this mass of rock and trees was heard sevsral miles away; hut until the discovery hy the party alluded to, no one knew whence the noise procesded. The locatlon is ahont three miles from "Laird's" on the Coos Bay wagon road.

A PHOTOGRAPHIC MARVEL.—One of the wonders of astronomy, and photography as well, is fonnd in the fact that after an exposnre of 33 minutes, the same instrnment which renders visihle to the human eye stars of the fourteenth magnitude, whioh in the entire heavens would register ahout 44,000,000 of stars, shows to the photographio eye 134,000,000, and on an exposure of one hour and 20 minutes would throw hefore the astonished gaze of the hsholder a luminous dnst of 400,000,000 stars. Never hefore in the history of hnmanity has man possessed the power of penetrating so profoundly into the depths of the infinite.

LIGHTING A MATCH BY STEAM.—An interesting experiment is sometimes tried with dry high-pressure steam issuing at a jet, which is rather astonishing. If n common matoh head is hel l in the invisihls portion of the steam jet, close to the nozzls, it at onoe lights, and the fact seems oonvincing as to complete dryness, as the faintest moisture would prevent ignition even at the highest temperatnre. This experiment proves dryness of the steam at the point of contact, hut if throttling exists hehind the jet, the steam snpplied by the hoiler may he in itself wet and dried hy wire drawing.

VARIATION IN DIAMETER OF TREES.—The diameter of trees varies not only from summer to winter, but from day to day. They are larger from noon until twilight next morning than from twilight to noon; they are smaller ln winter than in summer. Watsr and the sap of tress expand not only in proportion as they rlse ahove, but also as they go below the freezing point. Low temperature as well as high promotes evaporation, and the trees evaporate from their branches in winter, and so the ooldsr the weather the more they shrink.

WHITE-PINE BOARDS are said to he now ohtained hy redncing small trees and limhs of clear wood to pulp and pressing them in molds of any desired size.

A LUMINOUS PROJECTILE to he fired from a gun is the idea of a Russian officer. He claims great usefulness for discovering the movements of hostile vessels in a contest at night.

Good Health.

Injuries and Diseases of Nerves.

Nerves must be renewed through the medium of the nuclei which are in the inner side of the sheath discovered by Schwann. These fibers receive impressions and expend stimulus. The process of degeneration in a nerve is first a destruction of the myeline, multiplication of the nuclei and loss of continuity of the axis cylinder. There are not, as previously supposed by some, a special set of nerves which have as their function the creation of trophic conditions; the motor and sensory nerves are of themselves able to produce such a condition.

The return of sensibility to a part of the body supplied by a nerve which has been cut quite through does not indicate positively that the nerve has been reunited; the power of muscular action and other evidences are also required. When nervous power has been lost and partially restored, hope must not be abandoned, even if progress is slow, because months may be required for the reoperating process. Feeling generally returns sooner than muscular power. Nerves which have been injured may have pieces taken out and the sound end stretched till they meet, when they will reunite. Even nerve-grafting according to this author may be possible.

No benefit has been conferred on victims of St. Vitus dance by surgical experiments on the nervous system, but when epileptic fits occur, because of an injured nerve, these fearful spasms have been stopped by dividing the injured nerve between the injured part and the higher ganglion. Tetanus is not found to be caused by injury to the nerves. The best cure for facial neuralgia is found to be nerve-stretching, and is much better than cutting the nerves. —*Journal of Anatomy*

Poisonous Character of the Oleander.—A German paper says: It is perhaps not generally known that the leaves of the beautiful and gorgeous oleander are endowed with extremely poisonous properties, and that injurious effects may follow the cultivation of the plant in inhabited houses. The poisonous character of the plant is mentioned by Pliny, and recent investigations have shown that the old Roman naturalist was right. In Madrid, a few years ago, several people were poisoned by eating game which for some reason had been roasted with oleander leaves. In the southern parts of Spain and Italy, the grated bark is used as poison for rats, mice and vermin, and places where the oleander grows in abundance are considered as unhealthy as the terrible fever swamps, and are shunned by the people. In Northern Africa, where the oleander grows luxurfantly and adds a wonderful charm to the banks of every stream, it is not tolerated near human habitations, and in some districts its cultivation near houses is prohibited by law. It is a significant fact that the flowers of the oleander are shunned by bees. As the oleander is very common in California, the children should be carefully warned against it, or, what would be better, train it into a tree and prune high enough to keep the leaves and flowers out of the reach of little fingers.

The Human Breath a Poison.—At a recent meeting of the Academie des Sciences, Prof. Brown Sequard referred to some experiments he had conducted with a view to determine what, if any, were the toxic effects of the human breath. In condensing the watery vapor coming from the human lungs, he obtained a poisonous liquid capable of producing immediate death. This poison is an alkaloid (organic) and not a microbe, or series of microbes, as might have been imagined. He injected this liquid under the skin of a rabbit, and the effect was speedily mortal. The animal died without convulsions; the heart and large vessels were engorged with reddish blood, contrary to what is observed after ordinary death, when the quantity of blood is moderate and of a dark color. In conclusion, this eminent physiologist said that it was fully proved that respired air contained a volatile toxic principle far more dangerous than the carbonic acid, which was also one of its constituents, and that the human breath, as well as that of animals, contained a highly poisonous agent.—*Medical Press.*

The Sea Safer Than Land.—It may be a surprise to many to learn that statistics prove the sea to be safer to live on than land. The death rate of sailors in the British merchant marine is under 12 per thousand; the loss of life by shipwreck is about a quarter of this; in fact, there are more lives lost among miners from accident than among sailors, and many more among railway employes.

Dislodging a Leech.—A man in Portland, Wash., recently swallowed a leech while drinking from a hose. It took hold at once and for some days nothing could dislodge its hold. An old army surgeon was consulted who settled the case effectually. He put the patient to bed and kept him full of whisky for three days, when the leech got soaked and let go its grasp.

Recovering Sight.—Capt. Williams of Jeffersonville, Ind., 20 years blind, is recovering his sight. He thinks the glare in his room of an electric street light has something to do with the recovery.

Useful Information.

Is It Damascus Steel?—The Rademan-Telford Steel Company of Louisville, Ky., are continuing to make experiments with their new process, says the *Age of Steel*. Their recent experiments have been chiefly with laminated steel. Two or more sheets of steel treated by their process, with iron sheets sandwiched in between the steels, have been welded together in one heat. After being taken from the fire, it requires a great deal of force to separate the layers, and after they have been rolled once, the welding is so firm that it is quite impossible to separate them. The Hall Safe & Lock Company have experimented with the Rademan-Telford steel, and are said to pronounce it superior to their own laminated steel made at a great expense. The Rademan-Telford steel, after treatment, is very soft, and holes are easily punched in it; but after tempering, it is almost impossible to drill a hole into the sheets with the finest tools made of Mushet steel. The tempering is effected by heating the iron once and then immersing it in cold water. Specimens of the tempered Rademan-Telford steel were submitted to the Navy Department, and naval officers say that the process seems a re-discovery of the lost art of making Damascus steel.

The Oldest Drummer.—The oldest traveling man in the country, Mr. J. C. Page, started out in 1852 with half a dozen shoes in an old fashioned handbag. He sought his first order from a former employer in Montpelier, Vt., who listened to the youthful and ardent commercial traveler and then exclaimed: "Why, boy, do you think you can sell shoes by samples?" The youth thought he could. After a mature deliberation the merchant remarked: "Well, Joel, I don't believe you would deceive me; you can send me a box of those shoes." To any one who has not watched the rapid increase in the number of commercial travelers of all classes every year this story must prove interesting. That a vocation employing hundreds of thousands of persons every year, and with hundreds of millions of dollars invested, could grow up during one man's lifetime almost surpasses belief, says the Kansas City *Times*. The business has grown from the single venturesome Yankee boy of 1852 to 200,000 in 1880. It is expected the present census will swell that number to fully 400,000.

Lions and Locomotives.—The lions of India appear to be going the way of the great bustard and dodo, says the London *Daily News*, and the reason is found in the extension of railways, for the monarch of the forest entertains mortal antipathy to the smoke and screams of locomotives. Within the memory of many persons lions were common enough in Rajputana, and even now the roar of one may be heard occasionally in the wildest part of Central India; but the new railway from Nagpur is now being constructed through this country, and this is practically a notice to quit served upon the few remaining lions in the central provinces.

Lemons Are Used for Soap in many countries where they grow. When, for instance, the men and women of the West Indies want to wash their hands, they squeeze the juice of a lemon over them briskly in water until they are clean. There is an acid in the lemon similar to that used in soap, and in countries where oranges grow in great plenty, country gentlemen use the cheapest kind for blacking their boots. The orange is cut in two and the juicy side of one-half is rubbed on the soot of an iron pot and then on the boot. Then the boot is rubbed with a soft brush and a bright polish at once appears.—*Sacramento Union.*

Wood Brought to a Mirror Polish is coming into use for ornamental purposes in Germany, and has this advantage, that, unlike metal, it is not affected by moisture. The stuff is first treated with a bath of caustic alkali for two or three days, at a temperature between 164° and 197° F. Next comes a dip in hydrosulphate of calcium, for from 24 to 36 hours, after which a concentrated solution of sulphur is added. After another soak in an acetate of lead solution, at 95° to 120° F., it is thoroughly dried and polished with lead, tin, or zinc, as may be desired, when it resembles shining metal.

The New White Lead Process.—The new apparatus invented in Glasgow, Scotland, for the manufacture of white lead consists of three distinct parts, namely, a furnace, a condenser and a washing machine. The lead is untouched by hand, the whole of the process being conducted by machinery. The manufacture is kept going by shoveling into the furnace a quantity of lead ore, and that is converted into white lead, washed and dried, in three hours, as compared with four months by the old system, and the price of sulphur of lead production is reduced nearly two-thirds.

New Soldering Mixture.—A new and effective soldering mixture has been invented and patented by Mr. C. N. Waite of Littleton, N. H. It consists of lactic acid and glycerine, the best proportions being one pound of each of these substances, with eight pounds of water.

To Find Any Color Contrast.—The following is a good rule to find the contrast of any color: Cut out a circular piece of the petal of any flower, and put it on a white paper, look at it fixedly for a few seconds with one eye, then look off the color on to a piece of white paper, and you will see a bright ring of another color; that ring or circle is the right complementary color or contrast to the color in the petal.

Paper or Pasteboard may be rendered waterproof as follows: Mix four parts of slaked lime with three parts of skimmed milk, and add a little alum; then give the material two successive coatings of the mixture with a brush, and let it dry.

The Oyster is one of the strongest creatures in proportion to his weight in existence. The force required to open an oyster is more than 1300 times its weight.

The Builder.

Slow Burning Construction for Dwellings.—For cheap houses, or houses usually described as being "of moderate cost," it may be that there is not yet any method of slow burning construction that can be afforded. Some day there will be, but the time has not perhaps arrived when the economy which is absolutely required in such cases can be combined with the security which would be highly desirable. But no man who builds, or has built for him, a house costing $10,000 or upward, has a right to neglect any means which science has brought to light for the prevention of fire or for retarding its progress in the event of its breaking out. On this subject *The Standard*, an insurance journal, has the following timely remarks: It seems to us that the slow burning construction required in factories by the mill mutuals might be transferred to wooden dwelling-houses, as far as the floors are concerned, at least. The arrangement of widely spaced, heavy beams, with thick plank flooring, is susceptible of very tasteful architectural treatment, and would do away with the numerous horizontal flues formed by the usual spacing of joists. The plank floors could be deadened with a layer of asphalt, snugly held in place underneath by sheathing, and this layer would also prove a barrier to the rapid spread of fire. The walls and partitions might also be constructed of fewer but heavier timbers, with thick coats of plastering keying between laths, but slightly raised from the sheathing. Such a structure, we think, could oftener be saved from the flames than those constructed by the usual method.

Iron and Steel for Wood.—It appears that special attention is being paid in France and England to a more general substitution of iron and steel for wood wherever practicable in manufactured articles, such, for instance, as building materials, boxes and packing-cases, barrels and casks, carriages, carts and other vehicles, furniture, fencing, railway work, sheds, signal-boxes, telegraph poles, etc. In France there have recently come into use hollow iron window frames and doors which are said to be light and strong, and of far greater durability than could ever be expected of wood. There is no reason, too, it is thought, why corrugated barrels of iron and steel should not be used for liquors, since milk and preserved fruit and other articles are kept in cans. Steel is finding much favor among carriage builders, but there is still much prejudice against the metal being used in the manufacture of furniture. The general adoption of steel sleepers is warmly advocated by some, as is also the employment of iron and steel in the construction of railway cars; and the erection of wooden sheds, signal-boxes, etc., by railway companies as at present, might, it is urged, be profitably and economically substituted by steel.

The Plain Design Is Best.—In house-building, only a high degree of artistic talent, which costs money and must have plenty of money at its command, can be safely employed in elaborate ornamentation. On this point the Philadelphia *Real Estate Record* quotes from an exchange the following sound advice: "One of the chief reasons for the failure of cheap houses to look well is the fact that they are overloaded with ornaments. If those who wish to build cheaply would be content to build plainly, the results would be more satisfactory to the eye. The same fault is noticed in cheap furniture. It is always disfigured with fancy turns and machine carving, while to find a piece of plain, substantial finish, one must look at the high-priced goods. Too many men only able to build a cottage load it with weak imitations of the handsome decorations of the palace, and the result is thoroughly inharmonious. In the cheap house let plainness of construction reign from foundation to gable. Let the ornamentation be not in the woodwork, but in the painting. Then the effect may be whatever desired, and may be changed at the pleasure of the owner."

Elevator Speed.—The competition of builders and experts has succeeded in accelerating the speed of elevators until, in some instances, it has reached 500 feet a minute. A few years ago 200 feet was considered a very rapid movement for an elevator. It is very encouraging to hear the opinion expressed by experts that there is not much danger in the modern swift running elevator when it is carefully managed and looked after by an expert.

Engineering Notes.

A Civil Engineering Era.

This is the greatest hour for the civil engineer that the world has ever seen. Tremendous problems everywhere are being thrust upon him for solution. Take the World's Fair for 1892. The discussions pertaining to it are of consuming interest to civil engineers. The paramount questions of drainage, the lake front, the lowering of the railroad tracks, construction of viaducts, and the erection of phenomenal towers, are all directly in the line of the profession. Not one of these is a project of small import, but all of the propositions call for the exercise of the very highest mental qualities in the calling.

The drainage system alone will call into use the varied artistic, mechanical and scientific knowledge of the best men who write "C. E." after their names. It involves a knowledge of the topography of every foot of ground in the city and far beyond its limits. It proposes a network of sub-waterways and an amount of excavating which is little less than stupendous. The disposition of the excavated material alone presents a problem, which is possibly answered, however, in the probability that it may be needed as filling for the fair grounds proposed on the lake front.

Another question connected with drainage, and one which is figured in with the calculations of far-seeing engineers, is the archlag of the river and the unification of the south, west and north divisions.

The World's Exposition, its grounds, its structures and its sanitary features will call high engineering talent into play wherever the site may be located, and particularly so if the grounds are to be made, as it now looks, "from the waters of the lake."

The subject of grade crossings in the city, while not so much discussed in public, is deemed of the utmost importance in engineering circles. So sure are the gentlemen of the profession that it is a great coming question that the Society of Western Engineers has taken time by the forelock and is gathering data with the greatest care and at large expense, showing the course and levels through the city of every railway—main, switch and stub. The ultimate demand, it is thought, will be to have the tracks lowered to within four feet of city datum, and the whole sewerage system and the viaduct arrangements, so far as inaugurated, made to correspond to the requirements of the new track level.—*Western Machinist*

The Great Pennsylvania Ship Canal.

The great work of connecting the Ohio river and the city of Pittsburg with the Great Lakes by a ship canal is now in a fair way of being fully realized within a reasonable period of time. It will be one of the most important works of internal improvement ever undertaken in the country. At a meeting of the commission held three weeks ago, its engineer, John M. Goodwin, in making his report of the work done during the past month, said that, having carefully observed the conditions existing along the Shenango line, he sees nothing amounting to a very serious obstacle to the construction of a ship canal on the route in question, and he is of the opinion that the result of the straightening and material deepening of the Shenango river and the deepening of the Beaver, which will be effected in any proper construction of such a canal along these streams, and the maintenance all along the 51 miles of valley, extending from a point three miles above Sharpsville to Rochester, and thence along the right bank of the Ohio river to Pittsburg, will be a grand waterway, bearing not only the qualities of a great commercial highway, but also those of a beautifying and sanitary and power-supplying river. He believes that the region in question thus endowed will become the scene of industrial and social development, exceeding in commercial importance and in all desirable qualities and conditions any heretofore anywhere attained. Mr. Goodwin, in concluding his report, holds that the projected waterway should meet with no opposition from railroads. He says that the valuable and indeed absolutely necessary agency of the railways in the matter under consideration is of course fully taken into account in his view of the subject. He fully believes that the traffic incident to the construction of the canal would largely increase the business of the railways of the districts adjacent to the canal, and that the development following the establishment of the canal would induce a railway traffic in the regions affected by the canal far in excess of any otherwise possible.

Niagara Will Surely Be Harnessed.—So it would seem, at least. The Cataract Construction Company, which proposes to build a tunnel around Niagara Falls, and to run machinery in factories by means of water-power, has signed contracts with the Niagara Falls Power Company. The contracts are not to take effect until some minor difficulties are overcome. By this it may be understood that some people still refuse to sell their land to the company. But this is likely to be overcome. The Cataract Construction Company is an organization formed under the laws of New Jersey. Its officers are New York men. Edward A. Weeds is president, F. L. Stetson, vice-president, and W. B. Rankine, secretary.

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Passing Events.

The decision in the Francoeur vs. Newhouse case rendered this week, involving the question of mineral and agricultural land on railroad grants, is one of the most important to the mining industry ever given in this State. It was decided in favor of the mineral claimant, which will be a great relief to some hundreds of mine-owners in California whose property was in danger of practical confiscation.

The events in connection with the foundry strike have been somewhat exciting during the past week, blood having been shed and more or less shooting having occurred. More police have been stationed in the iron district of the city so as to prevent further trouble.

The plan of executing criminals by electricity, for the first time tried on the murderer Kemmler, in New York, is not likely to find further favor, judging from the experience in this case. The man was killed, but the death was apparently not instantaneous and the current had to be turned on a second time to complete the work.

The renewal of the order of the Government authorities to reserve from location the tracts of the *Sequoia Gigantea*, or big trees, in this State is an excellent thing. There are not many groves of these giants in the world, and there is plenty of timber in the State without destroying such magnificent trees.

San Bernardino County Mines.

With this number of the PRESS is printed as a supplement a sketch map of a portion of San Bernardino county, showing the important mining districts and other features, including town, railroads, springs, wagon roads, etc. With this is also an outline section showing the relative hights of the mountain ranges and peaks.

On the bottom of the map is printed a list of the prominent mines of the county, developed and in process of development, producers and non-producers, but susceptible of being made dividend-payers with the assistance of capital. The geographical position of these mines is so indicated that their location is easily fixed on the map. There are on the list 157 mines carrying the ores of gold, silver, copper, lead, antimony, iron, zinc, etc.; two marble quarries, two granite quarries, three sandstone quarries, one salt-bed and one borax measure. This map and list of mines were prepared for the MINING AND SCIENTIFIC PRESS by James H. Crossman, who is writing for us a series of articles on the resources of the county, one of which, relating to the mountainous regions, appears on another page.

It was not the intention in this case to make much more than a mere outline map, correct as far as it goes, but lacking details of a more complete one now being made on a larger scale by Mr. Crossman. This will, however, serve the purpose of showing the mining districts and locations of the prominent mines of the county, together with such features as give the general reader an idea of the section of country it represents to a fuller extent than any other map yet printed as far as we are aware.

San Bernardino is the largest county in the State and many of its resources are entirely undeveloped. It already produces more silver than any county in California, and its citrus fruits have the widest reputation for excellence. Such is the range and variety of the region that the miner and horticulturist both flourish to each other's benefit and to the benefit of the State itself. The articles describing this county are written by Mr. Crossman from notes taken while inspecting the county during several visits. He leaves this week for another tour through the county to gather fresh material.

Beach-Sand Mining.

On the ocean-beach near San Andreas, Santa Cruz county, about 20 miles from the city of Santa Cruz, is now in successful operation a machine for saving the gold in the black sand and concentrating, if necessary. They have been experimenting with the machine for some time on the beach, and are now confident that it saves all the gold and handles the large amount of ten tons an hour. The machine is worked right on the beach and the ocean water is used. The gentlemen who work this machine understand their business and are preparing to extend their operations.

Besides the ocean or outside beaches, there are numerous inland "beaches" or deposits of this sand. A company has been formed in Santa Cruz under the leadership of Jesse Cope, Esq., an old-time miner and now a successful merchant of that town, to operate the Leonard farm near San Andreas. All necessary machinery is already on the ground, and the gold-saver will be completed this week and work at once begun.

The general agency of this new gold-saving machine has been given to F. H. Hausman 320 Sansome street, this city, who will give any desired information as to cost, etc.

The Foundry Business.

Buyers of machinery and other iron work should better realize that notwithstanding there is trouble in this city with the striking molders, the manufacturers are in a position to do work as usual. Many orders are being sent East for work that should be done here. The foundry-owners have brought men here at great expense and trouble, to take the places of those who have struck, and can undertake any kind of a job now just the same as they could before the strike commenced.

The San Francisco foundries are the largest manufacturing establishments we have in California, and should be liberally patronized by all who want anything they can produce. It is unjust to them to send away work which they can do here. Those having orders to fill ought to consider twice before having work done elsewhere. We are assured by the foundrymen that they are now able to do any kind of work required of them. Still, there is lack of orders, and the foundry and machine-shop business is very dull indeed.

The Molders' Strike.

The trouble between the foundrymen and molders in this city reached a point this week when more blood was shed and the second victim of this strike went to his account. This time the evidence leaves no doubt about the man who was shot being one of the strikers. He entered a street-car with a companion to "persuade" a non union molder who was riding there and during the argument struck the young man, who, to protect himself from injury, drew a pistol and killed his assailant. The name of the non-union apprentice molder was Walter Rideout and that of the striker Henry A. Siebert. Rideout was an employe of the City Iron Works at North Beach and the other man a member of the Molders' Union.

About the same hour, on the same evening (Saturday), two non-union molders were attacked on Howard street by a number of strikers, and pistols were again used but no one was killed. Several of the men were, however, injured. Pistol-shots have also been fired at the men in the windows of another foundry.

Since these acts of violence the number of policemen in the foundry district has been increased and attention is being paid by the authorities to preserve order. Arrests are being made of persons who have made threats or intimidated others, and the "pickets" will not be permitted to congregate in groups around the foundries but must "move on" or be subject to arrest.

The methods adopted by the strikers have greatly prejudiced their case in the eyes of the public. There is no objection to men refusing to work under certain conditions, or trying to gain their points by any lawful methods, but there is decided objection to their using force and interfering with the business or work of other people. These so-called "pickets" should be compelled to go away from the vicinity of the iron works, and the foundrymen ought to be protected in conducting their legitimate business.

It is a disgrace to a civilized community when men cannot go peaceably about their occupation without having to arm themselves and seek police protection, but the frequent assaults show that these things are necessary in the iron districts of the city. Some very stringent measures should be adopted against the lawless element among us, whether as individuals or banded together in the name of a labor union. The largest manufacturing establishments in California are the iron works of San Francisco, yet they are obliged to call upon the police to protect their men in going to and from their homes. Nearly all trades and manufactures are injured. Such a state of affairs will not long be tolerated.

Our Correspondents.

The PRESS feels rather proud of the many correspondents it has represented in its pages in these days. Every issue of the paper contains several communications from men who have something to say and who say it in a manner that every one can understand. These correspondents are mostly practical men, and others in their lines can learn something by reading their letters.

In this number of the paper, for instance, are several letters from men actively at work in the mining districts of the coast. They write on subjects of interest to miners elsewhere. The very practical description of the conditions of finding gold in gravel from the pen of Mr. J. F. Talbott, now being continued in a series of articles, will be found of value to gravel miners and those who have made a study of the subject of the auriferous river-beds found in our lava-capped divides. The articles by Mr. Crossman on the mineral resources of San Bernardino county, besides their general interest, give many details of the mining conditions in that section of the State. This week, as last, he deals with the mountain districts of the county. The description of the reduction works and process of the Calumet Co. in Shasta county by one of our traveling correspondents is of the greatest interest to those engaged in milling gold ores. Mr. Hermanson describes a new method of the determination of iron; Mr. Blackburn, the Cascade gold-mining region; and another correspondent, some of the quicksilver mines of California.

This week, as for some months past, the PRESS prints many articles from contributors which add much to its value to mining men. We are always glad to add to our list of correspondents, however, and shall be pleased to receive letters from others who may have anything of interest to contribute to the general stock of knowledge.

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held on Monday evening, President H. W. Harkness in the chair. A small shark of the man-eating species, the first of the kind ever caught in this bay, was presented to the museum. It is a rare fish for such northern waters as these, though a few have been seen at San Diego.

Prof. Gustav Eisen, who has recently returned from a trip to the big-tree forests of the Tule and Kaweah rivers, called the attention of the Academy to the magnificent groves of the *Sequoia Gigantea* along these rivers, which are now being ruthlessly destroyed. On the Tule river are to be found the largest number of big trees to be found anywhere in the State. A very large portion of this marvelous timber has been purchased by private parties, who are now cutting down the trees as fast as possible. There are hundreds of these monarchs of the forest 20 and 30 feet in diameter which have been cut down and only a small portion of the lumber in them utilized; the rest has been left to rot on the ground.

Professor Eisen saw the stump of a tree near the Tule river, Tulare county, that had just been felled. It was about 33 feet in diameter and the hight was not less than 250 feet. The man who cut the tree down sold it for $60. It was calculated that from the top of the tree 60,000 shakes would be made. A part of the trunk has been secured for exhibition at the World's Fair. In this same region there was cut a monster tree 41 1-3 feet in diameter and 250 feet high. A part of the trunk of this tree was sent to the Centennial. The rest of the tree was left to rot. Professor Eisen said it was a sad sight to see such great trees destroyed. The stump of the tree which was sent to the Centennial contains 6126 rings, indicating in all probability that the tree was that many years old.

There are still many tracts of land covered with huge redwoods which the Government still possesses, and there is now an effort being made to have these groves perpetually reserved from sale.

On motion of Professor Eisen the Academy instructed the President to appoint a committee of three to draft a memorial to the Secretary of the Interior requesting that official to do everything in his power to save the remnant of the fast-disappearing big trees. Gustav Eisen, J. R. Scupham and W. S. Chapman were appointed such committee.

SAN BERNARDINO COUNTY MINES.—The following corrections should be noted with reference to the list of mines printed on the margin of the map issued with this number of the PRESS. The Garfield mine is in Township 10, Range 1 E., instead of 2 E.; Occidental, Nos. 1 and 2, are in Range 1 E.; Olio in Range 1 E.; Hanover in Range 1 E., and Thunderer in Range 2 E. The following additional mines should also be noted: Oriental, Township 10, Range 1 E.; and the Dunderberg, Gohlin, Dragon, Veto and Maiden, all in Township 10, North Range, 1 E.

CHARLES C. GRAHAM, Charles Hill and Ed. Holden of Philadelphia are in Salt Lake City. Mr. Graham owns the Philadelphia Smelting and Refining Works at Pueblo, Colorado, while the other gentlemen are associated with him. They are in Utah for the purpose of purchasing the right to use the Russell process of treating ore by infiltration in Colorado.

THE Ellensburgh (Wash.) *Capital* says many settlers in the Big Bend country have been driven away by the ravages of squirrels that swarm in countless numbers in that region.

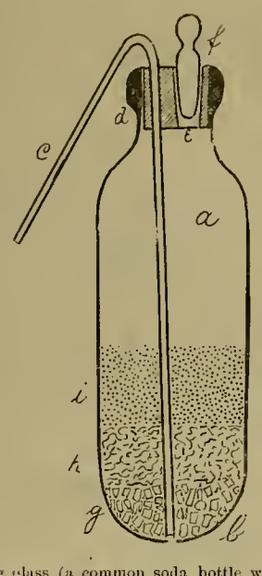
On the Determination of Iron.

[Written for the PRESS.]

Mr. Clemens Jones has contributed an elaborate paper on the determination of iron by titrating with permanganate of potassium (Method of Marguerite), published in the Transactions of the American Institute of Mining Engineers, Vol. XVII, pag 111. The old method of reducing ferrisulphate to ferrosulphate requiring some time and much patience, Mr. Jones has devised an ingenious apparatus for the rapid reduction of ferrisulphate by filtering the solution through pulverized zinc.

May it be justified by the importance the subject has for the metallurgist to publish the way the author uses to perform the same operation, dispensing altogether with a vacuum pump and that expensive machinery, invented by Mr. Jones, substituting for it a little automatically working arrangement, which, owing to its simplicity, will be fitted up by any assayer or student.

In the accompanying sketch is *a* a bottle of



strong glass (a common soda bottle will do), with a round bottom *b* from which the last drop of fluid can be removed by the siphon *c*.

The stopper *d* has a second boring e to be stoppered by the stopper *f* and wide enough to allow the easy passing of the tip of a 100 c. c. pipette.

The bottom of the bottle is covered with small pieces of broken glass *g*, over which is spread a layer *h* of glass wool or fine fibers of asbestos, carefully cleaned. This mineral filter will support the layer *i* of pulverized zinc, and it ought to be dense enough to retain any particles of the latter.

The bottle being filled up as indicated and the stopper *d* having been secured, so as to fit tightly, 100 c. c. of diluted sulphuric acid are transferred to it with the pipette. It will suit best to make up in a Winchester the standard solution of sulphuric acid of 2%, to be used throughout the operation, or of 1% in case a 200 c. c. pipette is used.

The fluid will rest upon the zinc, prevented from penetrating it by hydrogen, but as soon as the hole *e* is stopped tightly with the stopper *f*, the growing pressure of the gas forces the fluid through the layer of zinc *i*, that of glass wool or asbestos *h* and out through the siphon *c* into a spacious beaker placed beneath. The fluid in the beaker, being diluted with water (distilled and otherwise clean water ought to be used throughout) and acidulated with sulphuric acid (standard solution), ought to be titrated immediately with permanganate of potassium and the same operation ought to be repeated with new quantities of 100 c. c. sulphuric acid (standard solution) each, until the result of titrating appears constant, this being necessary because the zinc contains iron, the amount of which will be fixed after a few titrations, thus allowing to make a close correction for each assay.

The way a correction for iron contained in the pulverized zinc is to be made, of course, will depend upon the accompanying constituents in the solution of sulphate of iron to be titrated and ought to be calculated by the manipulating chemist according to the case. Mr. Jones dwells at length upon the impurities of zinc and gives a great number of examples with the correction he applies when titrating, but he never tells how he gets that correction.

In order to prevent this uncertainty from being transferred to the method here expounded, we will track the course of operating for the simplest case. At first we must standardize our solution of permanganate of potassium, which we have so far diluted that it will just allow using the plunger in the burette. We take a piece of fine, soft and well cleaned iron wire, weighing about as much as the iron in our assay; we make the correction for carbon in the weight of that wire (about $\frac{1}{2}$ %) and dissolve it in 100 c. c. of our diluted sulphuric acid. After dissolving we dilute to 300 c. c., well mixing in a stoppered shaking bottle, and titrate 100 c. c. after passing it through our reductor. This done, we immediately pass 100 c. c. diluted sulphuric acid through the reductor and titrate it, repeating this until we get a constant reading. Now we may repeat the operation with a new 100 c. c. of the solution of iron and we ought to find exactly the same result. All readings noted, we proceed to figuring the titre. Assuming we got a as the constant number of c. c. permanganate of potassium when titrating repeatedly 100 c. c. diluted sulphuric acid, as required before, we know that a will represent the iron that is extracted from the zinc by 2 grm. H_2SO_4 when passing through the reductor. Assuming the titration of 100 c. c. of our solution of iron consumes b c. c. permanganate of potassium and that when titrating afterward the diluted sulphuric acid as prescribed, we are using at first d c. c. and then e c. c. before we arrive to the constant number of a c. c. permanganate of potassium, then will b + (d—a) + (c—a) be the exact number of c. c. permanganate of potassium, consumed by titrating 100 c. c. of the solution of iron used for standardizing, the last two members of the sum belonging to that iron, intercepted by the filtering layers of the reductor.

Supposing the simplest case of an assay for iron, we suppose we got our iron, parted from other metals, precipitated by ammonia; then we dissolve it in 100 c. c. of our sulphuric acid, containing 2 grm. H_2SO_4. We dilute the solution to 300 c. c., pour it into the mixing bottle (this being necessary as the ferric sulphate by its gravity settles to the bottom), shake well and titrate 100 c. c. after passing it through the reductor. Then we repeat titrating by 100 c. c. sulphuric acid at a time unto the constant number of c. c. permanganate of potassium. After this we make the controlling titration with a new 100 c. c. of our solution. Should there appear a difference in the results, it will prove a mistake or a leak in the apparatus, which having been repaired, we may use the remaining 100 c. c. of the solution for checking the results first obtained.

Let x be the number of grm. Fe we are determining in 100 c. c. of our solution; assuming we used f c. c. permanganate of potassium when titrating the same and further on g c. c. and h c. c. by titrating repeatedly 100 c. c. diluted sulphuric acid until we arrive to the constant number a, then will f + (g—a) + (h—a) be the number of c. c. permanganate of potassium, satisfying 100 c. c. of the solution of iron. As we have already standardized the permanganate of potassium, we will find the number of grm. Fe resulting from the titration. Be it p, then in the equation p = x + y, y is the wanted correction, that is the number of grm. Fe extracted from the zinc in the bottle while reducing the solution.

Using quantities as those before recommended, the reduction is always complete and the fluid drawn from the reductor ought to be neutral, unless the reductor be out of order. (The testing with sulphocyanide of potassium requires some discretion; you may see no coloring when mixing the two drops upon a porcelain plate, but after drying there will appear a pure white scale with a fine red contour, betraying the ferricum.)

Consequently y grm. Fe is that iron extracted from the zinc by an excess of H_2SO_4 over that consumed in oxydizing x grm. Fe to $FeSO_4$, when we took 2 grm. H_2SO_4 contained in 100 c. c. of our standard solution. Substituting antomic weights, we find $(2-\frac{98}{56}x)$ grm. H_2SO_4 to be that excess.

Be *q* the number of grm. Fe that correspond to a c. c. permanganate of potassium in titrating, then obviously $(2-\frac{98}{56}x) : y = 2 : q$, which equation together with p = x + y give the final value of x.

July, 24, 1890. OSCAR HERMANSON.

New Stockyards and Packing-House.

It now seems pretty certain that mammoth stockyards and packing-houses will be established at Biden Station, in San Mateo county, where both water and rail transportation are available. The company has purchased there some 3000 acres of land at a cost of $776,000

The principal parties engaged in the transaction are Nelson Morres, a large holder of Atlantic & Pacific railroad stock; Philip D. Armour, who, in addition to his stockyards and packing establishments, is also a large holder of Atlantic & Pacific securities; Hammond & Co., Swift & Co., and P. D. Iler, the millionaire pork-packer of Omaha, who has been the financial agent of the syndicate in San Francisco.

The 3000 acres purchased will be divided as follows: Twelve hundred acres will be used by the different stockyard corporations already organized in this city, and the other 1800 acres will perhaps be used for the shops and roundhouses of the Atlantic & Pacific railroad, which will be extended from Mojave on to San Francisco with all possible speed.

The following companies have been organized to operate the immense establishment: The Stock Yard Land Co., capital $2,000,000; the Avstory Co., for butchering, with large chilling and freezing houses, capital $300,000; the Stockyards Banking Co., capital $250,000; and lastly, the Stock Yard Co., capital $1,000,000. The last company includes the stockyard propsr. Millar & Lux will remove their butchering business to the new yards.

The butchering business will undoubtedly be transferred entirely to the new company'e establishment, thus ridding San Francisco of a great and dangerous nuisance. In fact, it is stated here that the company has arrangements made with all the large butchering firms in San Francisco. A thriving town will of a necessity be located at Biden, near the yards, as it is estimated that fully 4000 men will be employed in the stockyards and packing establishments, exclusive of the railroad employes, who will number at least 1000 more.

The packing company will compete not only for the coast trade in canned, pickled and packed meats, but it will secure the trade of the South seas, the Hawaiian islands, Alaska, Central and South America and China and Japan. With its advantages it can easily obtain the trade of all the countries mentioned, besides supplying the hundreds of steamers and sailing vessels which annually leave San Francisco.

Gold in the Cascades.

EDITORS PRESS:—The Cascade Gold Mining & Milling Co. is opening up some splendid gold and silver mines on Uncle Si mountain, near the Snoqualmie river, directly east of this place. One of their mines is showing up big. The ore is free-milling, with sulphurets, and there are thousands of tons of ore exposed going all the way from $18 to over $1000 per ton in gold, with some silver, some of it going over 50 ounces silver per ton. The vein of pay ore is immense. At some places it measures over 50 feet wide. The vein shows a little copper. The gold and silver is in a quartz and iron gangue. Formation, granite, porphyry and gneiss, with a little slate near by, good talc casing between the wall and ore. The talc also contains gold. Large prospects can readily be obtained all over the surface of the quartz claims. This gold comes undoubtedly from the ledge, as it is all rough and ragged-looking gold—just like that usually found around gold veins.

The Cascade Gold Mining & Milling Co. is developing its property by tunnel and will erect a No. 1 plant for treating its ore. The mines are only 2½ miles from the terminus of the Seattle, Lake Shore and Eastern railroad. Plenty wood and water. The ore can be mined and milled for $5 per ton. This portion of the Cascades between Mounts Rainier and Baker is a first-class mineral country—gold, silver, copper, lead and iron.

The writer speaks from personal observation—seeing is knowing. The day approaches and is near at hand when this grand old range will turn out its millions. CHAS. F. BLACKBURN.

Seattle, Wash.

TELLURIUM.—A dispatch from Redding, Shasta Co., dated Aug. 2, says: The stockholders of the Eureka tellurium mine are quite elevated over a new find in their shaft. After pumping the shaft out and sinking five feet, a fine ledge of gold and tellurium ore was discovered. The experts had proclaimed the mine no good, but this new discovery shows that a ledge rich in precious metal does exist. The mine is three miles from Redding.

Quicksilver Mines.

The Manhattan and Redington.

EDITORS PRESS:—Sixteen miles southeast from Lower Lake on the road leading from Morgan to Berryessa valley is the Manhattan quicksilver mine.

The principal owners, Knox and Osborne, were the original proprietors of the mine at Knoxville, more widely known as the Redington. While operating that mine as early as 1862, they began sending out prospecting parties of 10 to 20 men farther up the divide, and when a few years later on they had a good chance to sell the original mine, they moved to the present location. Tunnels are run everywhere about the hills like squirrel-holes. This firm employs none but white men—cooks and all. As they are just starting up a new furnace, it seems a very safe guess that the mine is prospering.

The Old Redington Still a Mine.

After riding two or three miles down the hill from Manhattan, we came to Knoxville and this famous mine. We chose the above heading, as it was reported not long since, in giving its output of quicksilver, that this was the "last dying kick." A. McMillan came there 16 years ago, a late arrival from Scotland, and began work as book-keeper. Conditions have favored him so that by steady industry and close, careful management, he is now proprietor, superintendent, underground foreman, furnace foreman, book-keeper and storekeeper. He showed us machinery and works with plans of mine and bodies of ore to convince us that the Redington may have a future quite as noted as its past. In addition to the mine, Mr. McMillan has 7000 acres of farming, range and timber land, and was very sorry he lost the chance last year to buy 5000 or 6000 acres adjoining him.

The old company never went more than 500 feet from their main shaft and neglected prospecting so that when they struck some low-grade ore that did not pay when quicksilver was selling at $27 per flask, and they happened to be losing in other quarters, they gave Mr. McMillan a very good chance to show his faith by his works.

Valuable Inventions.

My attention was called to the Livermore furnace and condenser. This furnace is for roasting fine ore that used to be made into adobe to prevent its clogging the draft of the old coarse ore furnace. In speaking of the improvement we understood Mr. McMillan to state that on some trials the Livermore appliances had turned out five times as much quicksilver from the fine ore as the coarse ore furnaces from a similar amount of coarser ore from same part of mine. Again we hear it reported that Mr. Osborne says that it is no trouble to roast the quicksilver out of the ore, but that the main point is to get a condenser that will save it; more than half the metal goes off in fumes. The large tract of timber that has been destroyed by fumes from the Bradford furnace gives color to this last statement.

We heard through a teamster who hauled the metal that the Redington was sending off 70 flasks per week last summer when only working 25 men. (This seems almost too good to be true.) It seems pretty clear that Mr. McMillan is remarkably certain to get his value back in labor or in silver when he pays a dollar out on the mine.

He struck a new body of ore, prospected it with a mule and whim, and has just sunk a new shaft and started a new engine. At the old shaft is a splendid plant that he will start up one of these days.

New Plan of Draughting a Mine.

This was done by Chas. Livermore and gave me a clearer idea than I ever before received of a mine. Each level was represented by a pane of glass with black ink showing shaft and tunnels and red ink to show the ore body. These panes were protected by sash made on two sides with round, wooden rods grooved and connected by little wire bolts. These rods rested in a rack that brought each one half an inch below and as much farther forward than the one above. This shows clearly the shaft and tunnels and the slopes and pitch of the ore body in each level.

If quicksilver holds its own and we see Knoxville next year, we expect to see all those cottages on the hill occupied again. The old mine is said to have yielded $5,000 000 worth of quicksilver, and we believe it is worth a dozen dead mines yet. F. S. C.

THERE are now in the Mission and Santa Paula petroleum districts, Ventura Co., 70 wells in operation. A new company will put down new wells in Hopper canyon and in the Sespe. Mr. Hutton says that prices have not advanced since last year, but that the market has greatly increased in extent and demand. The asphaltum, for example, is now sold as far East as New York, from which place an order for 2000 tons was recently received.

CERRO COLORADO MINE.—Some of the heaviest Mexican capitalists have organized a company to purchase and work the Cerro Colorado gold mine in Chihuahua and in the Batopilas mining district. This is considered the richest gold mine in Mexico. Work at the mine will be begun in 60 days.

Location of Prominent Mines.†

A

Mine.	Township.	Range.
Argus (placer)	3	1 E.
Aztec	6	1 E.
Alps	6	1 E.
Alpine	6	1 E.
Alida	6	1 E.
Alvord Group	3	3 E.
Atlantic	3	3 E.
Alabama	10	1 E.

B

Mine.	Township.	Range.
Buckeye	7	17 E.
Bullion (placer)	3	1 E.
Bald Mt. (placer)	3	1 E.
Buena Vista	3	2 E.
Black Hawk Group	3	2 E.
Beauregard	6	4 W.
Bonanza King	10	14 E.
Boss	6	6 W.
Buckeye	7	17 E.
Big Chief	7	17 E.
Brilliant	7	17 E.
Ballaet No. 1	10	1 E.
Ballast No. 2	10	1 E.
Blackfoot Con. No. 1	10	1 E.
Blackfoot Con. No. 2	10	1 E.
Blackfoot Con. No. 3	10	1 E.
Burning Mosoow	10	1 E.
Boca	10	1 E.
Belle Key	10	1 E.
Bullion	10	1 E

C

Mine.	Township.	Range.
Calumet	3	2 E.
Carbonate	7	17 E
Crœsus	3	2 E.
Canyon	3	2 E
Cliff	3	2 E.
*Cajalco (tin)	3	4 & 5 W.
Cynthia	3	1 E
Coupon	6	1 E.
Central	6	1 E
Crystal Salt	6	21 & 22 E
Cal. Marble & B. S. Quarry Co	1	4 W.
Carbonate	6	4 W
Cleveland	10	1 W.
Cutionra	10	1 W.
Commercial	6	5 W.
Clip Springer	6	5 W.
Colmanite (borax)	6	5 E
Calico	6	1 E.
Chief of the Hill	10	1 E.
Compass	10	1 E.
Calico Queen	10	1 E.

D

Mine.	Township.	Range.
Deglecez	1	6 E.
Dick Turpin	6	4 E.
Dana	10	1 E.
Daggett	10	1 E.

E

Mine.	Township.	Range.
Eureka	2	6 W.
Emma	6	6 W.
Eagle (placer)	3	1 E.

F

Mine.	Township.	Range.
Fours	3	2 E.
Florida	6	5 E.
Four Aces	10	1 E.

G

Mine.	Township.	Range.
Greenback	5	2 E.
General	6	6 E.
Gen McClellan	7	4 E.
Garfield	10	2 E
Grant	3	1 E.
Gambetta	12	10 E.
Greenwood (placer)	3	1 E.
Green	3	1 E.
Garvey	3	1 E.
Galena	1	7 E.
Granite (placer)	3	1 E.
Gulch	3	3 E.
Glasgow	1	4 E.
Golden Eagle	7	17 E.
Grant	10	1 E.
Gem	10	1 E.
Gray Carbonate	10	1 E.
Garfield	10	1 E.

H

Mine.	Township.	Range.
Hunter	7	17 E.
Heola	3	2 E.
Harrison, No. 1	3	3 E.
Hub	3	3 E.
Harrison, No. 2	5	3 W.
Hadsell	12	8 E.
Homestake	6	3 W.
Honey Comb	10	2 W.
Humming Bird	7	4 E.
Hawkeye	7	17 E.
Hermosello	4	6 E.
Holcomb Valley (pl)	3	1 E.
H. H. Rickets No. 2	10	1 E.
Harmonial No. 1	10	1 E.
Harmonial No. 3	10	1 E.

I

Mine.	Township.	Range.
Imperial	6	6 W.
I X L	12	8 E.
Illinois	10	1 E.

J

Mine.	Township.	Range.
Josephine	6	1 E.

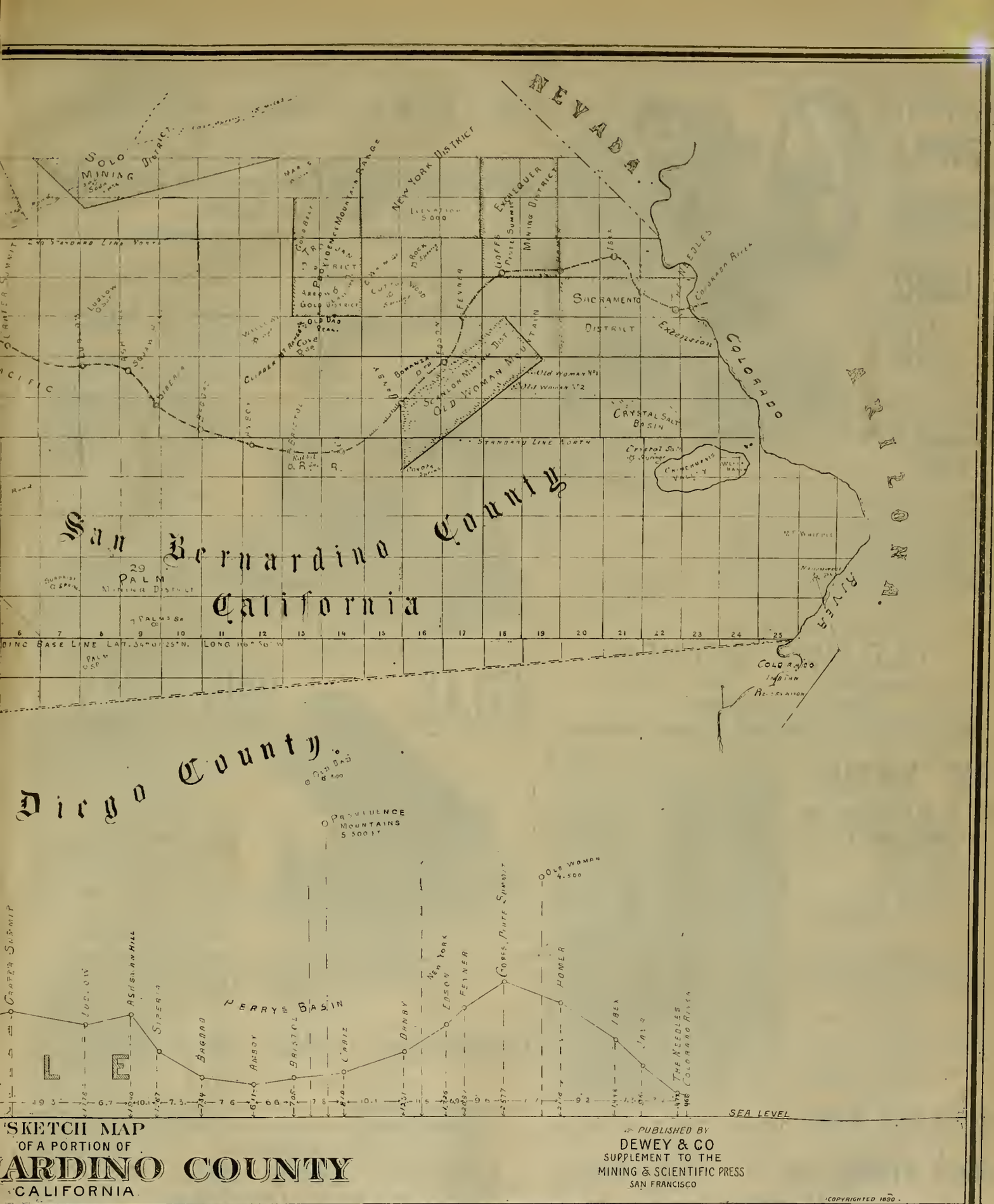
† All these mines are in San Bernardino Base and Meridian. All are in North Range except those few marked with * which are in South Range. The mines enumerated are all quartz except those otherwise indicated as "placer."

COMPILED FROM OFFICIAL AND OTHER SOURCES BY
J. H. CROSSMAN E. M.
FRED. MONCE Del.

DEWEY ENG. CO. S. F.

SAN BER

Mine.	Township.	Range.
Jeans Redondo	3	1 E
Jenny Lind	10	1 E.
K		
Keystone 1	6	1 E.
Keystone 2	7	17 E.
L		
Lilly	6	5 W.
Lawrence	2	4 E.
Last Chance (pl.)	3	1 E.
Lady Alice	3	2 E
Littlefield	3	1 E.
Last Chance 1	3	1 E.
Last Chance 2	6	1 E.
Lucky Tom 1, 2 & 3	6	6 W.
Lytle Creek (pl)	2	6 W.
Lyda Hetzel (pl)	12	10 E.
Lookout	3	2 E.
Little Giant	7	17 E.
Little Scottie No. 1	10	1 E.
Little Scottie No. 2	10	1 E.
Little Bonanza	10	1 E.
M		
Mammoth	10	1 E.
Morning Star	7	4 E
Magnet	6	1 E.
Modeeto	6	1 E.
Mammoth	3	1 E.
Midnight	10	1 W.
Morrison	3	1 E
May Queen	12	8 E.
Mt. Bear (placer)	3	1 E
Morongo King	1	4 E
Morongo	1	4 E.
Moonlight	3	1 E
Midnight	10	1 E.
Monumental	10	1 E
Meteor	7	4 E
May Flower	7	17 E
Mill Site	10	1 E.
Milwaukee	10	1 E.
Mastodon	10	1 E.
Monntain View	10	1 E.
N		
Neels (borax)	10	2 E.
New Year	12	10 E.
North Galena	6	5 W.
New Brunswick	3	1 E
Neil Con. No. 13	10	1 E.
Neil Con. No. 14	10	1 E.
Nonparallel	10	1 E.
O		
Old Lady	7	11 E.
Oregon No. 1 2 & 3	10	17 E.
Opal	6	1 E.
Oriental No. 1 & 2	10	1
Oleta	3	2
Oro Grande	6	3
Oro Fino	6	2
Overby Scott	1	4
Occidental No. 1 and 2	10	2
Olio	10	2
Old Oriental	10	1
Odessa	10	1
P		
Pinon	3	2
Portsmouth	3	2
Preciado	4	6



SKETCH MAP
OF A PORTION OF
ARDINO COUNTY
CALIFORNIA

PUBLISHED BY
DEWEY & CO
SUPPLEMENT TO THE
MINING & SCIENTIFIC PRESS
SAN FRANCISCO

COPYRIGHTED 1890.

Mine.	Township.	Range.
...sey	6	1 E.
...insville	6	1 E.
...rseverance	10	14 E.
...ck	7	17 E.
...litz	1	7 E.
...int Conception	6	1 E.
R		
...amona	3	1 E.
...uhy	2	4 E.
...ose	1	2 E.
...ainbow	3	1 E
...o Vista	6	1 E.
...bbin Hood	6	6 W.
...attle	1	7 E.

Mine.	Township.	Range.
Red Cloud	10	1 E.
Red Jacket	10	1 E.
Rising Sun	7	4 E.
Run Over	7	4 E.
S		
Stella	7	17 E.
Santa Fe	3	2 W.
Silver Top	7	17 E.
Senator	3	2 E.
Silver Cap	7	17 E.
Sebago	3	2 E.
San Jose	3	2 E.
Silver Odessa	10	2 E.

Mine.	Township.	Range.
Stevens Con. Borate No. 1	10	1 E.
Stevens Con. Borate No. 2	10	1 E.
Stevens Con. Borate No. 3	10	1 E.
Silver King	10	1 E.
Snow Bird	10	1 E.
Summit	3	3 E.
Stevens (borax)	10	2 E
Sweet Water	7	3 E.
Spring	6	1 E.
San Fluwer	6	1 E.
San Bernardino	3	1 E.

Mine.	Township.	Range.
Side Winder	6	3 E.
Sparkhula	6	5 W.
Stonewall Jackson	10	3 W.
Shearer (granite quarry)	5	4 E.
St. John Quarry (granite)	5	4 E.
San Francisco	1	7 E.
Southern Cal. S S. Co. Quarry	2	7 W.
Silver Belt	6	5 W.
Side Issue	6	6 W.
Silver Wave	7	17 E.
Silver Monument	10	2 E.

Mine.	Township.	Range.
T		
Thunderer	10	2 E.
Try	10	1 E.
Triangle No. 2	10	1 E
Tohoggan	3	2 E.
*Temescal Tin Gr'p.	3	4 & 5 W.
Tehachipi	6	1 E
Tip Top, No. 1	6	1 E.
Tip Top, No. 2	6	1 E.
Turks (placer)	2	6 W.
Tufa belt	10	1 E.
V		
Ventura 1	6	4 W.
Ventura 2	10	2 W.

Mine.	Township.	Range.
Vulture 1	12	2 E.
Vulture 2	12	2 E
Vulture (pl.)	3	1 E.
W		
Wasp	10	1 E
Wonder	3	2 E
Wide West	3	3 E.
What Not	7	4 W
Waterman	10	3 W.
West End	7	17 E.
Waterloo	10	1 E.
White Cedar (pl)	3	1 E.
Z		
Zephyr	10	1 E.

—THE—

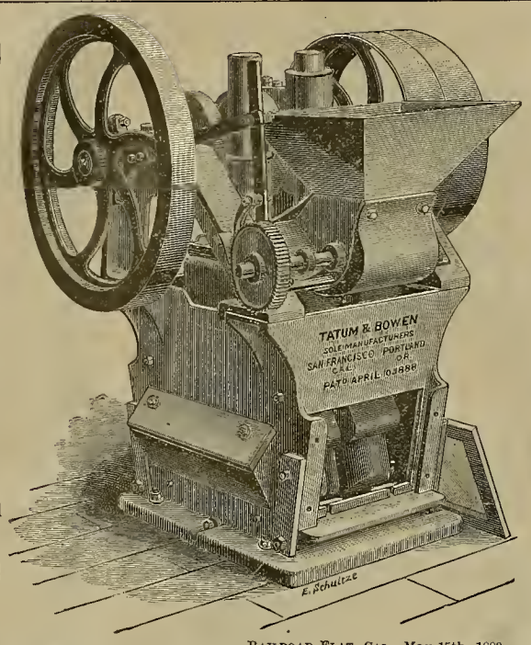
PERFECTED

DOUBLE

Economic

Quartz

Mill.



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That it will crush and discharge through a No. 30 mesh wire screen, 6 tons of average quartz per 24 hours; that, compared with the common stamps, the power required to do the same amount of work is considerably less—the slipping motion of the stamps reducing the ore much faster than the drop alone can; that the discharge is good, and as to amalgamating and saving gold, my experience with it is that it is just about the same as the ordinary battery.

To the above I shall add that the new Automatic Feed attached is a perfect success. It can, in a moment and without stopping, be adjusted to feed just as "high" or "low" as desired, and can be depended upon to supply the stamps with ore exactly as they need it. This is important, as it saves feeding by hand, which cannot be considered at the present day, or the purchase of a high-priced feeder.

Considered as a convenient Mill for prospecting, or for a small mine, it fills the bill.

Yours truly, [Signed] JAS. S. REYNOLDS,
Supt. New York Mine, Railroad Flat.

The Mills as we make them now are Far Superior to the one at the New York Mine.

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AND PORTLAND, OREGON.

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HOTELS,
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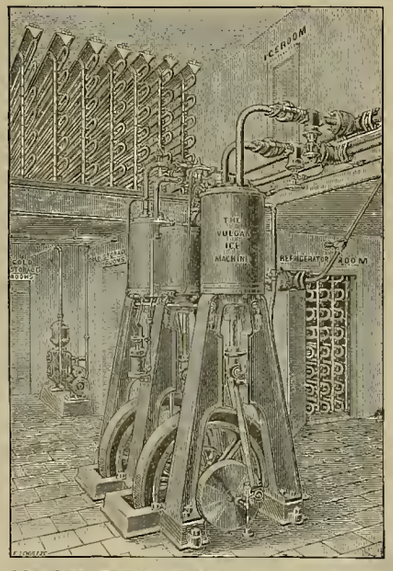

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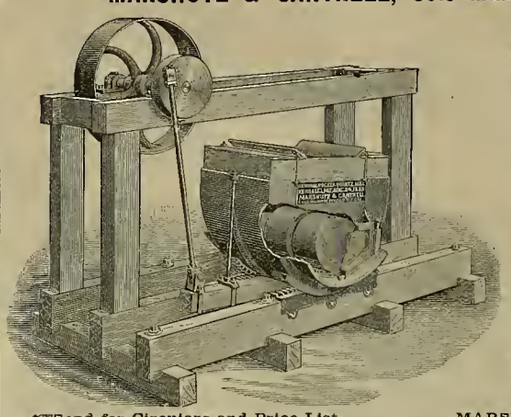

The Patentee and Manufacturers cordially invite miners to critically examine and pass judgment upon this improved system of milling and amalgamating ores in the following particulars:

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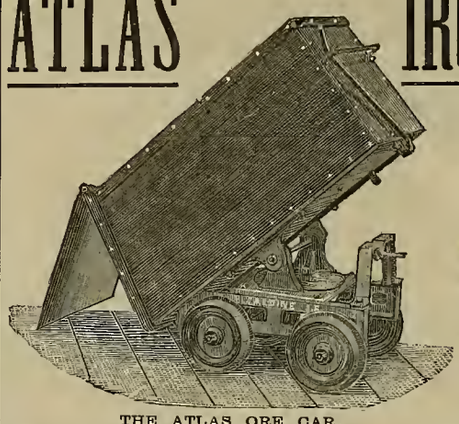

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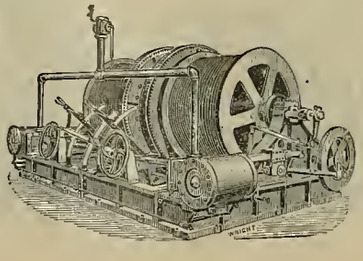

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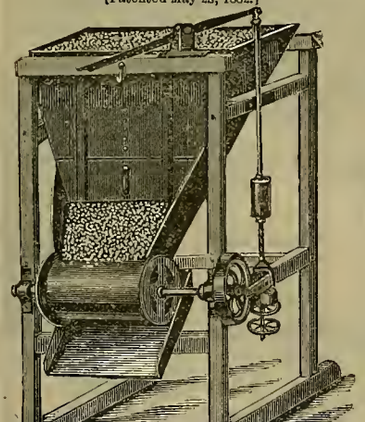
[Patented May 28, 1882.]



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In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.
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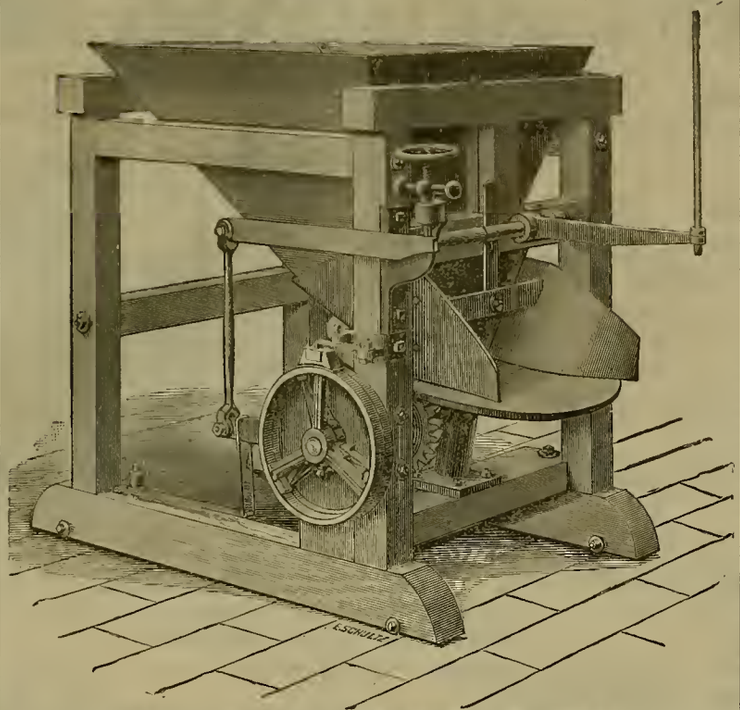

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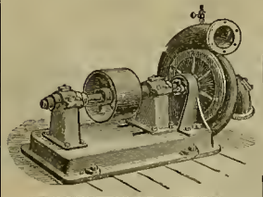

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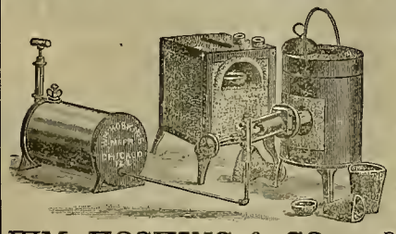

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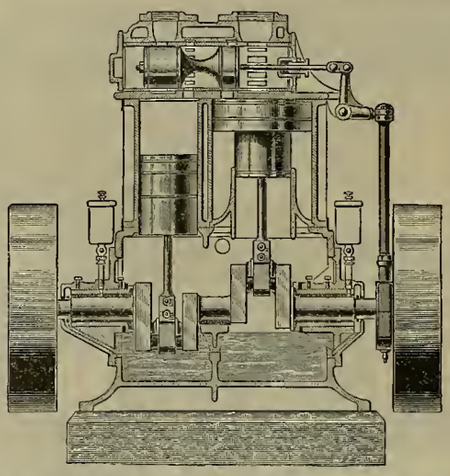

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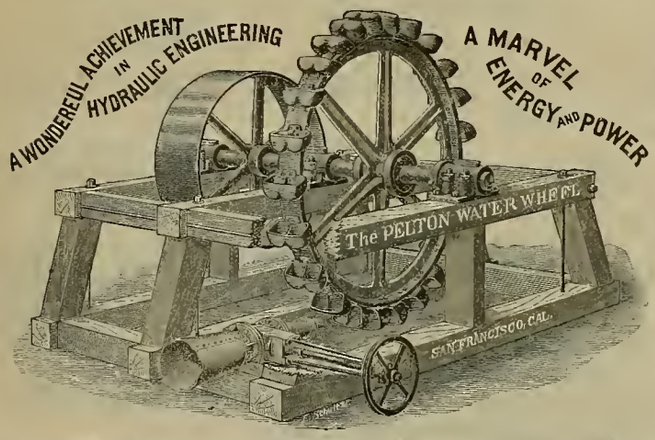
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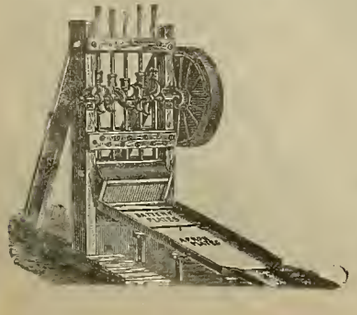

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Sectional Machinery FOR MULE-BACK TRANSPORTATION.

Pumping Engines and Cornish Pumping Machinery,

IMPROVED WATER JACKET

Blast Furnaces for Galena & Copper Ores,

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Roots & Baker Pressure Blowers,

SUSPENDED TRAMWAYS.

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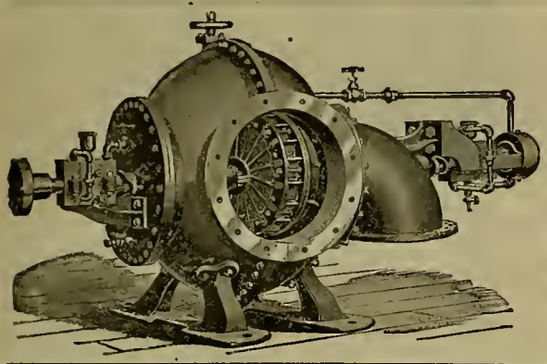
HELENA, MONTANA, Room 28, Merchants' National Bank Building, No. North Main St.

SOLE WESTERN AGENTS FOR TYLER WIRE WORKS DOUBLE CRIMPED MINING CLOTHS.



JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,
Springfield, Ohio, or 110 Liberty St., New York.

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BALDWIN LOCOMOTIVE WORKS.

ANNUAL CAPACITY 800. ESTABLISHED 1831.

LOCOMOTIVE ENGINES!

Adapted to every variety of service, and built accurately in standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Broad and Narrow Gauge Locomotives, Mine Locomotives by Steam or Compressed Air, Plantation Locomotives, Noiseless Motors for Street Railways, Furnace Locomotives, etc.

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N. W. SPAULDING SAW COMPANY

Manufacturers of SPAULDING'S Inserted Tooth AND CHISEL BIT CIRCULAR Saws.

SAW MILLS AND MACHINERY

Of all kinds made to order. Send for Descriptive Catalogue. 17 and 19 Fremont St., San Francisco

ESTABLISHED 1866.

Pacific Chemical Works.

HENRY G. HANKS,

Practical and Industrial Chemist, Assayer and Geologist,

718 MONTGOMERY ST., - SAN FRANCISCO.

☞ Will report on the condition and value of any mining property on the Pacific Coast. Rare Chemicals made to order. Instructions given in Assaying and Practical Chemistry.

Tioga District Mining Company,

Incorporated June 11, 1889. Capital Stock, $10,000,000.

BUY AND SELL

California Gold, Silver, Quicksilver, Copper and Lead Mines

OF ASCERTAINED VALUE.

Office, No. 13 PARROTT'S BUILDING, N. W. Corner of California and Montgomery Streets, SAN FRANCISCO, CAL.

WM. B. WIGHTMAN, Pres. WM. H. V. CRONISE, Sec.

INVENTORS, TAKE NOTICE!

L. PETERSON, MODEL MAKER,

253 Market St., N. E. cor. Front (up stairs), San Francisco Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential.*

THOMAS PRICE & SON,

Assay Office, Chemical Laboratory,

BULLION ROOMS and ORE FLOORS,

524 Sacramento Street, San Francisco, Cal.

COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.

WORKING TESTS OF ORES BY ALL PROCESSES.

SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

SELBY SMELTING and LEAD CO.,

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GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

MANUFACTURERS OF

BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, Etc., Etc.

ALSO MANUFACTURERS OF

Standard Shot-Gun Cartridges,

Under Chamberlin Patent.

JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

63 & 65 First St., cor. Mission, San Francisco.

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

M.C.C. BATTERSEA

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents for the Morgan Crucible Co., Battersea, England. Also for E. G. Dennistoun's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.

NO. 28 STEVENSON STREET,

Near First and Market Streets, S. F.

C. A. LUCKHARDT, Manager. ESTABLISHED 1869.

Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.

C. A. LUCKHARDT & CO.,
(Formerly Huhn & Luckhardt,
Mining Engineers and Metallurgists.

GREAT REDUCTION!

BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.

PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut or burred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

San Francisco Pioneer Screen Works,

221 & 223 First St., San Francisco, Cal.

JOHN W. QUICK, Proprietor.

WINCHESTER HOUSE,

44 Third Street, - San Francisco, Cal

This Fire-proof Brick Building is centrally located, in the healthiest part of the city, only a half block from the Grand and Palace Hotels, and close to all Steamboat and Railroad Offices.

Laundry Free for the use of Families.

HOT AND COLD BATHS FREE.

Terms, Board and Room, $1.00 per Day
And Upward.

Rooms with or without Board.
Free Coach to the House

J. POOLEY.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 7, 1890.

General trade continues to improve. The outlook promises more activity this fall than for several years past.

The money market continues easy with the outlook favorable to a continuance. This opinion is grounded upon the fact that all kinds of farm produce are selling at much better figures than obtained a year ago, while the mines are turning out more bullion. The higher price for silver will also have a favorable influence on the market.

The steamship China, hence July 31st for China, took out the following treasure: Mexican dollars, $16,008; gold coin, $41,601.

MEXICAN DOLLARS—The market is fairly active at 87½@88c, with the Chinese buying.

SILVER—The market fluctuated to lower prices abroad and at the East, but in this city and Carson City, the Mint paid $1.12½. The supply on this coast is light, or, at least, silver is not offering freely. The ore from the mines on the Comstocks is gravitating toward gold, the average now being over one-half gold. Eastern advices continue to report free shipments of silver to Europe where the supply is said to be below legitimate requirements.

QUICKSILVER—Receipts the past week aggregate 301 flasks, and exports 25 flasks to Mexico.

BORAX—Receipts the past week aggregate 1966 cds. The free receipts at this port are due to the cheaper freights by water to New York. The market is steady at current quotations.

LIME—Receipts the past week aggregate 3902 hbls., and exports by sea 100 hbls. to Honolulu. The market is quiet. Concessions, it is said, can be had on large orders.

ANTIMONY—The market is steady. Eastern mail advices report an easier tone.

IRON—Imports the past week aggregate 25 tons of Oregon. The market is firm. Eastern and English advices report a steady, firm tone.

COPPER—The market has an easier tone. English advices, while reporting the market weak, yet state that the undertone is good, owing to the large consumption. The weakness was caused by outside selling. At the East the market is still in favor of the selling interest, although under some speculative and weak holders selling prices are lower.

TIN—The market is dull but steady. European advices are in favor of sellers.

COAL—Imports the past week aggregate as follows: Nanaimo, 4835 tons; Coos Bay, 1100; Departure Bay, 841; Seattle, 1588. Total, 8364 tons. Wallsend for spot is quoted at 50 cts. advance. The market for all kinds is very firm, with the demand increasing. The continued strike at the Wellington colliery is against buyers, although it is said more non-union men are going to work. The tonnage to load at, loading at and on the way from Newcastle, N. S. W., is steadily increasing. The latest advices place the registered tonnage at 49,268.

Eastern Metal Markets.

By Telegraph.

NEW YORK, August 6.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	.50¾	1 1t	$17 00	$4 42½	$20 85
Friday	.51 3-16	1 13¾	17 00	4 42½	20 80
Saturday	.51¼	1 13	17 00	4 45	20 80
Monday	.51¼	1 13	16 85	4 50	20 85
Tuesday	.51¼	1 12¾	17 00	4 45	20 85
Wednesday	.50¾	1 11⅞	16 85	4 45	20 85

NEW YORK, August 5.—The tone of Lake Copper is not quite as strong; nominal rates, 17@17¼c, with sales reported for August at 17c and Arizona at 15½c; casting, 14¾c. The London market is somewhat weak. The Pig Lead trade is moderate and the article freely offered at $4.45.

Coal.

TO LOAD.	Per Ton.	SPOT FROM YARD.	Per Ton.
Australian	$ 7 50@$7 75	Wellington	$ 9 00
Liverpool Steam	8 00@ 8 25	Greta	$ 50 @ 9 00
Scotch Splint	8 25@8 37½	Westminster Brymbo	9 00
Cardiff	8 50@— —	Nanaimo	9 00
Lehigh Lump	15 50@17 00	Sydney	8 50 @ 9 00
Cumberland bk	13 50@— —	Gilman	6 50
Egg, hard	15 00@— —	Seattle	6 50
		Coos Bay	6 00
CANADIAN ANTHRACITE COAL.		Cannel	12 00
Egg, ship side	$12 50	Egg, hard	16 00
Egg, yard	15 00	Cumberland, in sacks	16 00
Stove, yard	15 00	do, bulk	15 00
Nut, yard	15 00	Wallsend	9 00@ 9 50

CORE.

English, to load	$12 00@13 00
English, spot, in bulk	13 50@15 00

Lumber.

Pine, Fir and Spruce.

	RETAIL.	JOBBING.
Rough Pine, merchantable, 40 ft	$20 50	$18 00
41 to 50 ft	21 50	19 00
51 to 60 ft	23 50	21 00
61 to 70 ft	27 50	25 00
1x3, fencing	22 50	20 00
1x4, "	21 50	19 00
1x3, 1x4 and 1x6, odd lengths	19 50	16 00
Second quality	17 50	15 00
Selected	25 50	23 00
Clear, except for flooring	31 50	29 00
Clear for flooring	31 50	.....
Clear V. G. No. 1 flooring	5 00	.....
Firewood	11 00	10 00
Dressed Pine, flooring, No. 1, 1x6	33 00	30 00
No. 1, 1x4	37 50	35 00
No. 1, 1¼x4, 1¼x6, and odd sizes	38 50	37 50
All sizes, No. 2	29 00	24 00
Stepping, No. 1	43 00	42 50
Stepping, No. 2	33 00	26 00
Ship timber and plank, rough	27 00	10 00
Selected planed 1 side, average 40 ft	20 00	25 00
" " 2 " " " "	31 00	29 00
" " 3 " " " "	33 00	31 00
" " 4 " " " "	35 00	33 00
Deck plank, rough, average 35 ft	35 00	33 00
Dressed, average 35 feet	40 00	35 00
Pickets, rough, B. M	20 00	10 00
½x1½, 4 ft long, ₱ M	6 50	4 25

Mining Share Market.

In the mining share market the Comstocks have been dull the past week under review, with prices gradually settling up to yesterday (Wednesday) in the Middle and North End stocks and also in the Gold Hill stocks, excepting Yellow Jacket and Crown Point. The market acted as if the pool had instructed their brokers not to bid for stocks, but quietly take in all they could. It is just such a market that creates distrust, destroys confidence and causes outside selling. With those in position to know, the opinion prevails that prices are rolling around bottom preparatory to another upward move, although points are out for another break before there is an advance. There is no doubt but that every influence has been brought to bear to have the outside sell, with, to a very considerable extent, success. Leading commission brokers report comparatively few stocks held on a margin by outside dealers. This of itself should inspire confidence in an upward move and attests the correctness of the opinion that an advance is near at hand.

In outside stocks, dealing has been quiet in the Tuscaroras. In the Bodies, reports are current of an assessment soon on Mono, which ought to break the stocks in that group, when there will be a buy. In the Quijotoas, Central developed more strength and activity in the Pacific Stock Board, but Peer, Peerless and Weldon were quiet.

Two assessments levied and more to follow are evidence that the pool is after stock, and that the mining share market is not dead—only sleeping.

From the Comstock mines official letters received from the Gold Hill companies, report lower assays in Crown Point, with the ore giving out. In Belcher the assays were $2 a ton higher. Prospecting work of an important character is going on in Belcher, Seg. Belcher, Challenge, Confidence, Yellow Jacket, Con. Imperial and Alpha. Advices from Savage and Hale and Norcross are of the most flattering character. The development in the former promises better than ever. Our Virginia correspondent writes as follows: In Confidence they are taking out ore through the Yellow Jacket shaft, that assays from $60 to $300 a ton, which they are calling low grade. Reliable miners say Challenge, Confidence and Yellow Jacket are looking better than ever. No one not in the ring can tell what becomes of the ore taken out of the three mines. In Ophir they have gone into an old drift, where they tapped a body of ore found 13 years ago, which they are taking out. The ore assays $80 a ton, although their returns make it only a milling proposition. In Hale and Norcross they are still repairing the shaft. The last ore milled assayed about $17 a ton, and the slimes went $45 a ton—the latter the ring is to get, and the former, after deducting *all* expenses, stockholders will get, if there is any left. In Overman they are hoisting over 100 tons of ore a day. That taken out last week assayed from $90 to $190 a ton, but it is given out as $19 rock. If the superintendent or the management of Overman disputes this statement of the high assays, it can be verified by letting responsible mining men in the mine to examine. He says that there is plenty of high-grade ore, but the ring is getting away with the hoodle.

The Alta management has sent another car of concentrates to Salt Lake. The question arises, who gets the proceeds from the sale of these concentrates?

San Francisco Metal Market.

WHOLESALE.

THURSDAY, August 7, 1890.

ANTIMONY	22½@	—
BORAX—Refined, in carload lots	8 @	—
Powdered " " "	8 @	—
Concentrated " " "	7½@	—
All grades jobbing at an advance.		
COPPER—		
Bolt	23 @	25
Sheathing	23 @	25
Ingot, jobbing	20 @	—
do, wholesale	18 @	18½
Fire Box Sheets	23 @	25
LEAD—Pig	4½@	5½
Bar	5½@	—
Sheet	7 @	—
Pipe	6½@	—
Shot, discount 10% on 500 bags Drop, ₱ bag	1 85 @	—
Buck, ₱ bag	1 85 @	—
Chilled, do	2 05 @	—
QUICKSILVER—By the flask	57 00 @	—
Flasks, new	— @	—
Flasks, old	45 @	55
TINPLATE—B. V. steel grade, 14x20, to arrive	@	—
B. Y. steel grade, 14x20, spot	4 80 @	—
Charcoal, 14x20	6 75 @	7 00
do roofing, 14x20	6 00 @	—
do, do, 20x28	12 00 @	—
Pig tin, spot, ₱ lb	23½@	—
CHROME IRON ORE, ₱ ton	10 @@	—
IRON—Bar, base	3 @	3½
Norway, base	4½@	5½
STEEL—English, lb	16 @	20
Canton tool	9 @	9
Black Diamond tool	8 @	9
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—

IRON	Spot.	To Load.
Glengarnock ton	34 00 @— —	30 @ —
Eglinton, ton	34 00 @— —	30 @ —
American Soft, No. 1, ton	— —@32 00	33 @ —
Oregon Pig, ton	— —@33 00	— @ —
Puget Sound	34 00 @— —	— @ —
Clay Lane White	— —@28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	— @— —	— @ —
Langloan	34 00 @— —	30 @ —
Thorncliffe	34 00 @— —	30 @ —
Gartsherrie	34 00 @— —	30 @ —
Barrow	34 00 @— —	30 @ —
Thomas	33 00 @— —	— @ —
Cargolleet	30 00 @— —	26 @ —

Meetings and Elections.

BENTON CON. M. CO., July 30. Directors—J. T. Hill, J. S. Knowlton, V. B. Allen, E. Heshres and Edward Howard.

LADY WASHINGTON M. CO., July 30. Directors—Monroe Thompson, R. N. Graves, S. G. Whitney, J. P. Martin and L. Osborn. President, M. Thompson; vice-president, R. N. Graves; secretary, L. Osborn, and superintendent, E. D. Boyle. The secretary's financial statement showed a balance in the treasury of $14,102.23.

RISOON IRON & LOCOMOTIVE WORKS, Aug. 4. Directors—W. H. Taylor, president; R. S. Moore, vice-president and superintendent; William Alvord, Lloyd Tevis, Jerome Lincoln and E. V. Joice. L. R. Mead was reappointed secretary.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Almont M Co	Arizona	2	¼	July 12		Aug 13	Aug 30	S Harman, 302 Montgomery St
Belcher M Co	Nevada	49	50	June 27		July 31	Aug 21	C L Perkins, 327 Pine St
Bodie Cons M Co	California	12	25	June 16		July 22	Aug 22	B. L. Burling, 309 Montgomery St
Bona Fors M Co	California	1	5	June 19		Aug 10	Sept 5	E K Taylor, 12 Montgomery St
Cons Imperial M Co	Nevada	28	5	July 17		Aug 30	Sept 11	C L McCoy, 329 Pine St
Cons Pacific M Co	California	12	10	Jun 21		July 28	Aug 20	F E Lucy, 330 Pine St
Crescent M & M Co	California	4	25	Jun 24		Aug 2	Aug 29	J H Isham, 310 Pine St
Crocker M Co	Arizona	9	15	June 16		July 25	Aug 25	N T Messer, 309 Montgomery St
Cruikshank G M Co	California	1	10	June 27		Aug 14	Aug 25	E J Koch, 211 Sansome St
Exchequer M Co	Nevada	29	25	July 10		Aug 14	Sept 4	O E Elliott, 309 Montgomery St
Golden Prize Con M Co	Nevada	4	25	Jun 19		July 30	Aug 18	C D Bennett, 330 Pine St
Gover M Co	California	2	25	July 15		Aug 20	Sept 6	Gray Dew, 13 and 15 Fremont St
Gray Eagle M Co	California	18	6	July 1		Aug 4	Aug 25	J M Buffington, 303 California St
Mayflower Gravel M Co	California	48	20	Aug 5		Sept 5	Sept 29	J Morzio, 328 Montgomery St
Occidental Cons M Co	Nevada	7	28	Aug 5		Sept 11	Oct 7	A K Durbrow, 309 Montgomery St
Silver King M Co	Arizona	3	20	June 9		July 17	Aug 11	A Waterman, 309 Montgomery St
Standard Cons M Co	California	3	50	June 2		July 15	Aug 14	J W Pew, 310 Pine St
Theraloff G M Co	California	4	1	June 9		July 26	Aug 23	W J Garnett, 306 Pine St
True Cons M Co	California	9	2½	May 26		July 21	Sept 15	J C Bates, 434 California St
Union Cons M Co	Nevada	41	28	July 21		Aug 26	Sept 15	A W Barrows, 303 California St
Utah Cons M Co	Nevada	10	25	Aug 5		Sept 15	Oct 2	A H Fish, 309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Baker Divide M Co	California	D M Kent	310 Pine St	Annual	Aug 18
Colorado River M Co	Colorado	J Treadwell	230 Montgomery St	Annual	Aug 18
Independence M Co	Nevada	J W Pew	310 Pine St	Annual	Aug 18
Julia C us M Co	Nevada	J Stadfeld	309 Montgomery St	Annual	Aug 12
Martin White M Co	Nevada	A B Co per	325 Montgomery St	Annual	Aug 21
Nava o M Co	Nevada	J W Pew	310 Pine St	Annual	Aug 12

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gato	309 Montgomery St	25	Apr 5
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	05	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	Jun 10
Derbec Slue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Aug 11

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$ 8,026	$.....
Alpha	11,009	.....
Andes	20,161	.....
Bodie Con	20,844	.....
Benton Con	88 250	.....
Belcher	*27,157	.....
Belle Isle	.....	2,400
Best & Belcher	8,822	.....
Bulwer	6,047	.....
Bullion	11,878	.....
Challenge Con	.....	4,380
Caledonia	5,892	.....
Chollar	†3,242	.....
Con. Cal. & Virginia	†11,610	.....
Confidence	2,100	.....
Con. Imperial	.....	24,342
Con. New York	10,650	.....
Commonwealth	.....	28,431
Crocker	.....	1,074
Crown Point	.....	*301
Del Monte	.....	7 962
East Sierra Nevada	3,510	.....
Eureka	†33,459	.....
Exchequer	634	.....
Gould & Curry	9,671	.....
Grand Prize	.....	31,105
Hale & Norcross	*4,312	.....
Holmes	.....	10,248
Independence	2,321	.....
Julia	0,014	.....
Justice	6,352	.....
Kentuck	2,006	.....
Lady Washington	13,679	.....
Locomotive	1,214	.....
North Belle Isle	.....	21,612
North Commonwealth	.....	9,138
Mexican	15,217	.....
Mono	6,307	.....
Navajo	.....	11,444
Nevada Queen	.....	18,344
Occidental	.....	988
Ophir	23,505	.....
Overman	†58,618	.....
Peer	132	.....
Peerless	1,042	.....
Potosi	3,863	.....
Savage	.....	*2,041
Scorpion	4,108	.....
Seg. Belcher & Mides	1,009	.....
Silver Hill	12,791	.....
Sierra Nevada	37,335	.....
Silver King	2,147	.....
Standard	13,556	.....
St. Louis	859	.....
Syndicate	4,534	.....
Union Con	8,130	.....
Utah	855	.....
Weldon	.....	551

*Bullion return and mine expense not included.
†More bullion to be heard from.
‡Mine expenses not included. Unsold bullion, $211,519 and other shipments to be heard from.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

PACIFIC FERTILIZING CO., Aug. 2. Capital stock, $100,000. Directors—Geo. H. Andrews, W. B. Wightman, Geo. H. Francœur, John F. Carroll, Arthur Hanratta.

MUTUAL OIL CO., Aug. 2. Capital stock, $500,000. Directors—M. B. Miller, Gardner Landon, Jr., E. S. Lockwood, Francis P. Landon, John Crilly.

WAMPUM TRUST CO., Aug. 2. Object, to carry on a real estate business. Capital stock, $250,000. Directors—Horace Hawes, Nathan H. Frank, S. H. Collins, Fred C. Clift, Charles L. Benton, A. E. Hawes.

WEST SHORE MUTUAL LOAN ASSOCIATION, Aug. 4. Capital stock, $3,000,000. Directors—Zerah P. Clark, Moses A. Gunst, Herman Zadig, Donald Mackenzie, Eugene de Sabla Jr., Wilburg G. Doane. Carl H. Thilo, Louis Mathe and Edward A. Pattison.

GRASS VALLEY QUEEN M. Co., Aug. 6. Capital stock, $1,000,000. Directors—C. W. C. Hutton, J. S. Emery, D. E. Hayes, N. Hamilton, D. Gutmann, J. T. Holland and F. S. Bennett.

MUTUAL PATENT MANUFACTURING CO., Aug. 6. Object, dealing in fire-escapes. Capital stock, $250,000. Directors, W. M. Castle, Geo. Lewis, L. P. F. Walter, B. J. Schmidt and L. A. Phillips.

NAPA THOMPSON-HOUSTON ELECTRIC LIGHT CO., Aug. 6. Capital stock, $50,000. Directors—C. P. Eels, Thos Addison, S. H. Taylor, M. Caspari and W. H. Waite.

WESTERN MERCANTILE CO., Aug. 6. Capital stock, $50,000. Directors—D. E. Alexander, N. A. Rohinson, I. P. Parker, W. F. Ames and S. J. Sims.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 17.		WEEK ENDING July 24.		WEEK ENDING July 31.		WEEK ENDING Aug. 7.	
Alpha	1.30	1.40	1.25	1.40	1.25	1.35	1.20	1.30
Alta	1.25	1.30	1.15	1.25	1.20	1.25	1.20	1.25
Andes	.60	.70	.60	.75	.65	.70	.65	....
Belcher	2 80	3.15	2.55	2 95	2.50	3.30	3.10	3.45
Best & Belcher	3.75	4.25	3.65	4.20	3.75	3.90	3.05	3.55
Bullion	3.15	3.65	3.55	4.15	3.05	3.90	3.65	3.55
Bodie Con	.85	1.10	1.05	1.20	1.15	1 25	1.20	1.30
Bulwer	.25	.30	.25	....	.25	.30	.25	....
Commonwealth	....	....	3 45	3.60	3.25	3.50	3.00	3.45
Con. Va. & Cal	4.00	4 60	3.75	4.20	3.80	3.90	3.75	4.00
Challenge	2.90	3 15	2.75	3.0	2.75	3.15	2.35	2.80
Chollar	3.65	3.95	3.70	4.00	3 20	3.65	2.80	3.40
Confidence	5.50	7.37	....	....	6.87	....	6.00	6.12
Con. Imperial	.40	....	.30	.40	.30	.40	.35	....
Caledonia	.45	.50	.40	.45	.40	.45	.40	....
Crown Point	2.80	3.15	2 60	3.0	2.65	3 10	2.70	2.95
Crocker	.20	....	.20	.30	.25	.30	.25	....
Del Monte	1.55	1.80	1.50	1.6	1.50	1.75	1 40	....
Eins a Con	4.00	4.25	4.00	....	3.75	4.25	4.15	....
Exchequer	.85	.95	.85	1.05	.85	.99	.65	.85
Grand Prize	.50	.65	....	....	.50	.55	.25	.45
Gould & Curry	2 55	3.05	2.60	2.95	2 55	2.75	2.05	2.60
Hale & Norcross	3.00	3.30	2.75	3.10	2.60	2.85	2.55	2.75
Julia	.25	.30	.30	.30	.20	.25	.25	....
Justice	1.50	1.60	1.45	1.55	1.40	1.50	1.40	1.45
Kentuck	1.40	1.50	1.30	1.45	1.25	1.60	1.20	1.30
Lady Wash	.35	.40	....	....	.25	.35	.35	.50
Mono	.60	.65	.60	.65	.55	.75	.50	.70
Mexican	3.10	3.40	3.05	3.40	3.25	3.65	3.15	3.45
Navajo	.70	.75	.60	.65	.50	....	.50	....
North Belle Isle	1.40	1.50	1.15	1.30	1.30	....	1.15	....
New Queen	.85	1 00	.75	.85	.80	....	.75	.80
Occidental	1.60	1.75	1.40	1.60	1.20	1.35	.80	1.15
Ophir	4.25	4.55	3.90	4.75	4.70	5.62	4.75	5.50
Overman	2.70	2.90	2.45	2.75	2.45	2.55	2.00	2.40
Potosi	7.25	8.00	7.50	8.25	5.37	7.75	6.12	7.12
Peerless	.25	....	.20	.25	.20	....	.20	....
Peer	.30	....	.15	.20	.15	....	....	....
Savage	4.20	4.85	3.80	4.55	3.70	4.20	3.30	3.95
S. B. & M	1.90	2.00	1.70	1.95	1.65	1.90	1.40	1.70
Sierra Nevada	3.25	3.55	3.10	3.80	3.05	3.30	2.85	3.15
Silver Hill	.35	....	.35	....	.30	....	.25	.30
Scorpion	.25	.30	.25	....	.25	....	.20	....
Union Con	2.75	3.10	2.60	3.00	2 65	3.50	2.45	2.85
Utah	1.00	1.10	.90	1.10	90	1 00	.65	.90
Yellow Jacket	3.00	3.35	2.95	3.30	2.95	3.55	3 25	3.40

Sales at San Francisco Stock Exchange.

THURSDAY, Aug. 7, 9:30 A.M.

250	Belcher	3.15	
200	Belle Isle	1.10	
200	Bodie	1.15	
700	Bullion	3.10	
250	Challenge	2.20@2.25	
50	Con. Cal. & Va	3.80	
300	Crown Point	2.75	
100	Eureka Con	3.95	
100	Exchequer	.75c	
100	Gould & Curry	2.15	
100	Grand Prize	.30c	
310	Hale & Nor	2.60	
200	Hendricks	.35c	
200	Julia	.20c	
500	Justice	1.40	
250	Kentuck	1 05	
100	N. Commonwealth	2.60	
100	Occidental	.80c	
210	Ophir	4.80@4.95	
750	Overman	2.00@2.05	
100	Peer	.10c	
700	Potosi	6.37½@6.62½	
150	Savage	3.40	
50	Scorpion	.20c	
150	Sierra Nevada	2.85	
200	Union Con	2.60	
100	Utah	.65c	
100	West Comstock	.40c	
150	Yellow Jacket	3.30	

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ONE of the Dodge ore pulverizers has been set at work at Juneau, Alaska, and Mr. Archibald Campbell, the owner of the mine, says it works well and crushes more than he expected it would.

Assessment Notices.

GOVER MINING COMPANY Location of principal place of business, San Francisco, California. Location of works, near Pr, town, Amador county, California.

Notice is hereby given that at a meeting of the Board of Directors held on the 14th day of July, 1890, an assessment (No. 2) of twenty-five cents (25c) per share was levied upon the capital stock of the Corporation, payable immediately to the Secretary, at the office of the Company, 13 and 15 Fremont street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Wednesday, the 20th day of August, 1890, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 6th day of September, 1890, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

GRAY DEW, Secretary

Office, 13 and 15 Fremont St., San Francisco, California

DELINQUENT SALE NOTICE.

CARMELO LAND AND COAL COMPANY, Location of principal place of business, San Francisco, California; location of works, Monterey county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 1) levied on the Fourth day of June, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
O'Connell, Annie A	18	100	$50 00
" "	10	100	50 00
" "	20	50	25 00
Green, Wm D	26	150	75 00
Eddy, Ira I	15	100	50 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of June, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 10, No. 415 Montgomery street, San Francisco, California, on SATURDAY, the Ninth (9th) day of August, 1890, at the hour of one o'clock P. M., of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

W. T. BAGGETT, Secretary.

Office, Room 10, No. 415 Montgomery street, San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 18) levied on the first day of July, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Bogart, O H, Trustee	423	350	$ 21 00
" " "	424	650	39 00
" " "	447	5,000	300 00
" " "	488	105	6 30
Barrows, A W, Trustee	537	2 4	17 04
Bowers, D	379	20	1 20
" "	404	500	30 00
Bullington, J M, Trustee	527	2,500	150 00
" " "	528	2,000	120 00
Francis, H L, Trustee	414	1,500	90 00
Nash, H W	269	104	6 24
Nordman, Leon	514	100	6 00
Stout, C S, Trustee	470	2,000	120 00
Searles, W A, Trustee	518	1,000	60 00
" "	510	593	35 36
Stetson, A M, Trustee	520	5,000	300 00
Taylor, J M, Trustee	532	1,040	62 40
Wetzel, Theo, Trustee	215	50	3 00

And in accordance with law, and an order of the Board of Directors, made on the first day of July, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on MONDAY, the 25th day of August, 1890, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California street, San Francisco, California.

CERTIFICATE OF PARTNERSHIP.

We certify that we constitute a partnership transacting business in the City and County of San Francisco, State of California, and in this State. Its principal place of business is at San Francisco, California. Its name is CONNOR & GRANT. The full names and respective places of residence of all its members are signed hereto, and the said copartnership to commence June 1st, 1890.

SAMUEL B. CONNOR, San Francisco, Cal.
ANDREW S. GRANT, San Francisco, Cal.

STATE OF CALIFORNIA, City and County of San Francisco. } ss.

On this 12th day of July, in the year one thousand eight hundred and ninety, before me, Geo. T. Knox, a Notary Public in and for the City and County of San Francisco, personally appeared Samuel B. Connor, of said City and County and State, and Andrew S. Grant of the same place, each personally known to me to be the persons whose names are subscribed to, and who executed the within instrument, and they acknowledge to me that they executed the same.

In witness whereof, I have hereunto set my hand, and affixed my Official Seal, at my office, in the City and County of San Francisco, the day and year in this certificate first above written.

[NOTARIAL SEAL.] GEO. T. KNOX, Notary Public.

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, July 31, 1890. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 34) of One Dollar ($1.00) per share was declared, payable MONDAY, August 11, 1890, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer Books close August 5, 1890, at 3 o'clock P. M.

F. B. PRITCHARD, Secretary pro tem.

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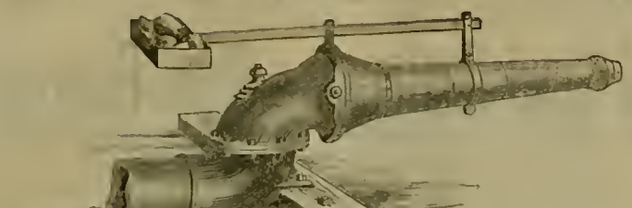

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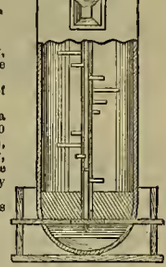

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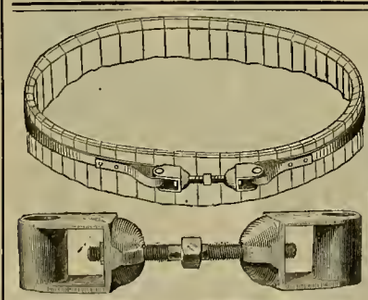

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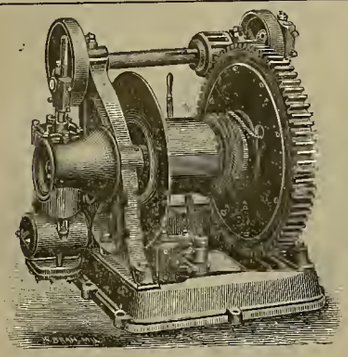

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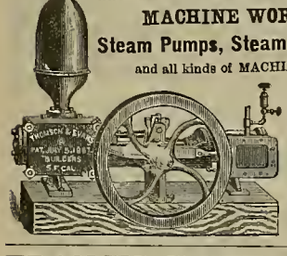

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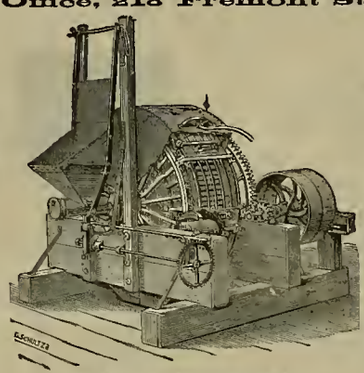

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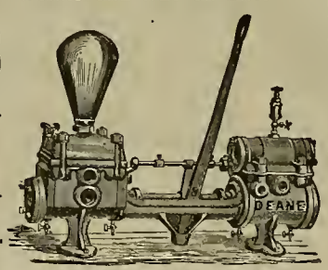

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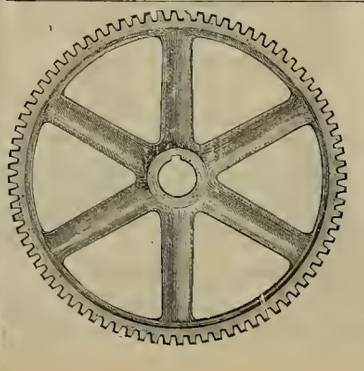

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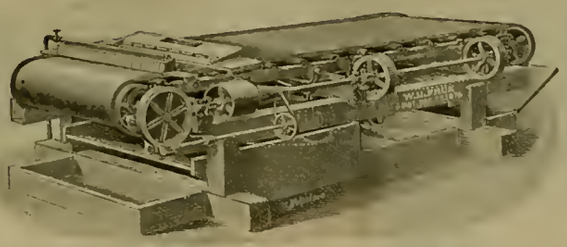

Protected by Patents December 22, 1874; September 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

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THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 41 additional Frues and more stamps have been purchased. ADAMS & CARTER.

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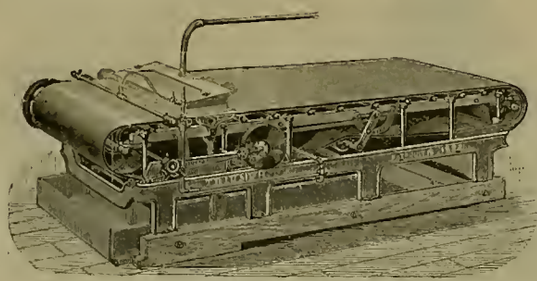
We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.



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Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

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At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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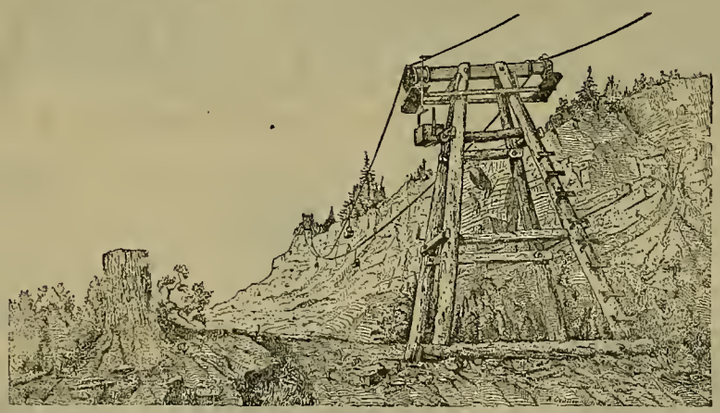

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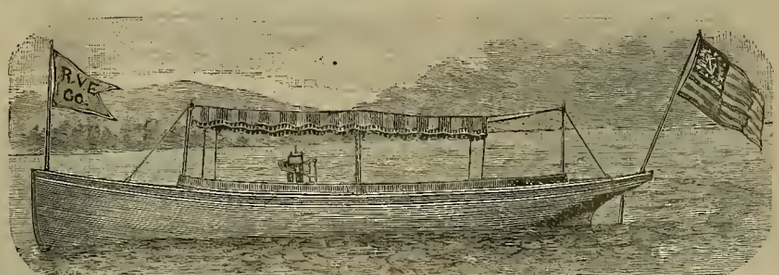
Yours truly, GEO. HAAS.



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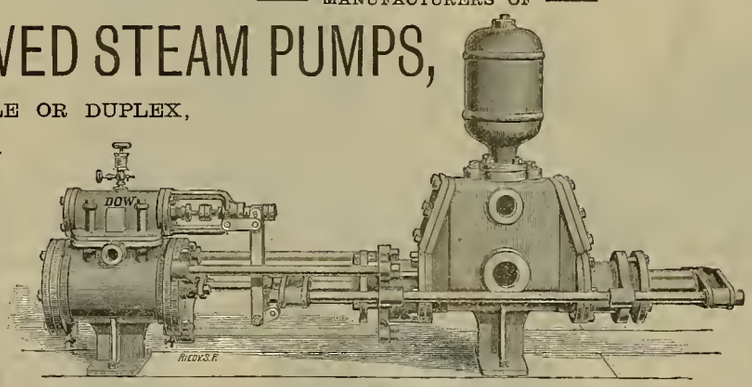

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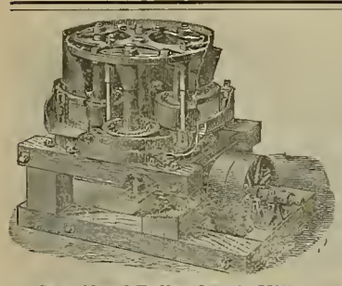

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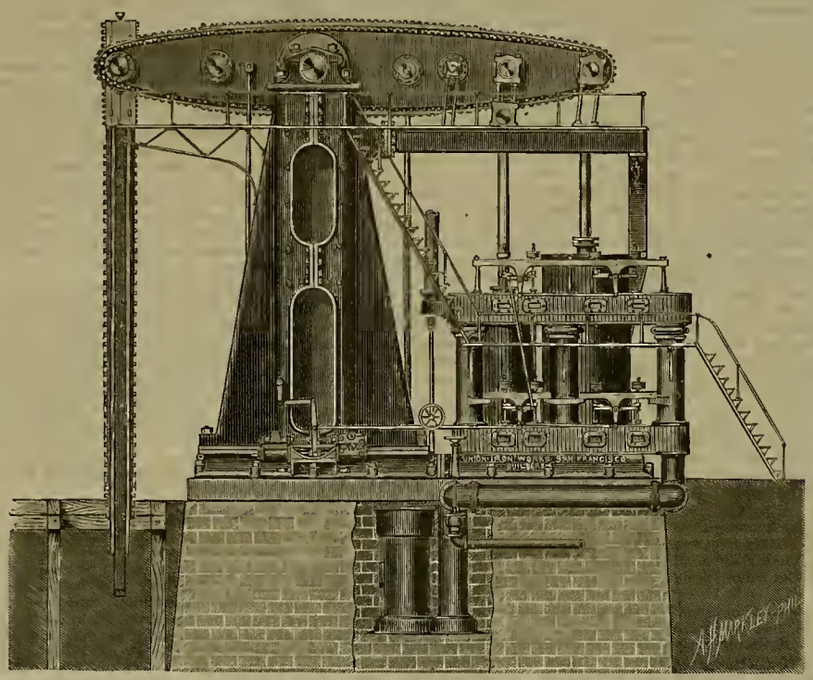
VOL. LXI.—Number 7.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, AUGUST 16, 1890.

Three Dollars per Annum.
Single Copies, 10 Cts.

Beam Engines.

On this page is given a true elevation of one of a pair of beam engines designed by the Union Iron Works of this city for the Starr Flour Mills near Port Costa. The engines are of 3000-horse power and the heaviest in the world applied to grinding flour. The mill has a capacity of 7000 barrels a day. The beam engine is the earliest form of arrangement, and must always remain one of the best that can be devised. It attains many important objects that no other arrangement permits. There is but little angular thrust or strain. The beam represents connections of great length. The reciprocating parts are balanced, their weight resting on the trunnion of the beam, so that friction is almost eliminated. The floor space occupied is much less than for directly connected engines. The beam furnishes direct and convenient motion for air, supply and other pumps, which can all be erected within the quadrangle formed by the framing. The first cost is more than for horizontal or directly connected engines; but this is more than compensated by the avoidance of lateral strains and greater endurance, and free working of the engines. When in good working order, the weight of one man on the paddle wheel of a steamboat will turn an engine of 500 h. p. The beam being only part of the transmitting machinery, valves of any kind can be used the same as in the case of horizontal engines. Where the valves have frequently to be operated by hand, or the engines are large, the balanced poppet kind are preferable. The Corliss type are shown in the drawing.



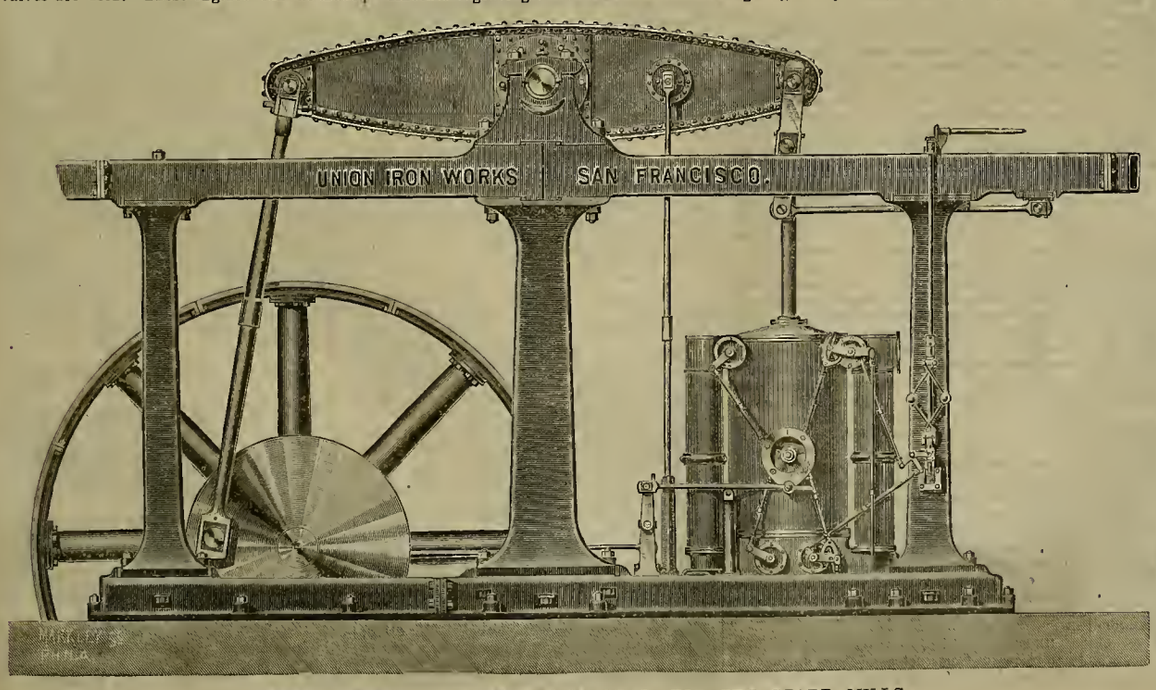
SPECIAL BEAM ENGINE FOR PUMPING PURPOSES.

For inland steamers of the better class, no other engine can compare for endurance, absence of friction, economy of working, and convenience of handling. The machinery is set "on its edge," so to speak, and occupies only a narrow parallelogram fore and aft, leaving the main deck almost clear; in this case poppet valves are used. These engines can be made double or single, or compounded, if required, and arranged to suit any purpose where a large and constant amount of power is required. The Union Iron Works have constructed a large number of beam engines of various sizes and kinds, and are provided with patterns and drawings to suit for all kinds of purposes from 100 to 2000 h. p.

Another engraving shown herewith is an elevation of a differential compound direct-acting beam engine for pumping purposes. The valve motions are controlled by the Davey differential gearing, so the engine automatically adapts itself to the resistance or amount of water, the speed or number of strokes being regulated accordingly. This form of engine constitutes a pumping plant of the highest class, capable of giving a duty of 70,000 to 80,000 gallons by the Cornish rule, and although more expensive at the beginning, is in the end more economical than engines of the non-automatic kind.

The valves are of the balanced poppet class. They are the most durable and easy of adjustment, besides permitting the freest possible inlet and exhaust. The condenser, air and feed pumps are all placed in a pit formed in the supporting masonry and low enough to secure efficient drainage of the cylinders and valve chambers.

On the left is shown the top section of a common pump rod and the mouth of a pump shaft, indicating the manner of making connection. The main beam, as shown, is for a deep lift, the pump stroke being less than that of the initial steam cylinder. This, of course, is varied to suit the hight to which water is raised, or other special conditions. These pumping engines are, when required, made in sections to facilitate transportation in mountainous or other inaccessible countries, all the parts being fitted and numbered at the works so as to be put together with rivets and screw-bolts at the place of erection. In such cases the main column, as well as the beam, is made of wrought iron, and many of the details of steel, to secure strength with light weight. The Union Iron Works make these engines of various sizes to suit special requirements.



BEAM ENGINE, CORLISS VALVE GEAR, FOR THE STARR MILLS.

NEW SILVER BILL.—Senator Teller has introduced a new silver bill in the shape of an amendment to the bill to discontinue the coinage of $3 and $1 gold pieces and 3-cent nickel pieces. The bill differs from the present law in that it retains the continued monthly coinage of 2,000,000 ounces of silver into standard dollars, strikes out the provision that the rate of coinage shall be until July 1, 1891, only, does away with the discretion given the Secretary of the Treasury as to notes issued in place of bullion, either in gold or silver, and provides for the free coinage of silver when the market price of 371.25 grains reaches $1.

DURING the first seven months of the current year, the Ontario mine of Utah produced 554 188 82 ounces of bullion and sold ore amounting to $355,575.21. Seven regular monthly dividends of 50 cents per share were paid, aggregating $3 50 per share, making a total of $525,000 in dividends for the seven months. The total dividends of the company, including No. 170, paid July 31st, are $11,150,000.

THE case of the shareholders of the Nelson Mining Company of Oakland, Cal., to oust S. W. Blasdell from the management of the Nelson mine at Baker, Or., and to have set aside a $50,000 mortgage on the mine, held by Blasdell, has been sent back to the State Court of Baker county by Judge Deady of the United States Court at Portland.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Gold Belt of Northern California.

Ancient River Channels and Gravel Deposits.

NUMBER X.

[Written for the MINING AND SCIENTIFIC PRESS by JAMES F. TALBOTT, Blue Canyon, Placer Co.]

All of these conditions certainly indicate the correctness of the theory in regard to there being but one main ancient river and tributaries within defined bounds of a certain locality, which contained the original deposit of gold—the source of all recent deposits in that locality. Another fact which tends directly to confirm this view is the discovery within the past decade of a channel deeper than any that has ever been worked or known to exist.

Very Deep Pay Channels.

The effect of this discovery on the future of mining and prospecting will be apparent when it receives the consideration its importance demands. Instead of thousands of dollars being thrown away under the old prevailing ideas that every outside deep gravel deposit overlies an ancient river channel, and the result disappointment and the locality condemned as barren, capital will be intelligently directed, under the new and progressive ideas, toward prospecting for and developing the original source of these deep channels where good and permanent pay will always be found. This deep pay channel was first discovered by accident in the Mountain Gate mine, by a body of cement and top deposit of unknown depth overlying it, which cut off the channel above on which they had been working. The developments made in the deep channel here, indicating its course, induced the belief that it continued down the Forest Hill ridge, and owing to the great width of this ridge between the high rims, the immense depth and width of the overlying deposit, the certainty of a large volume of water and the uncertainty of the position of the channel within this wide scope, it might be on one side of the ridge in one locality and in another on the opposite side. With all of these adverse conditions staring the prospector full in the face, any attempt to discover this channel here required a degree of courage and faith possessed by few, even of this noted fraternity. But one showed up equal to the task, and by his persistent energy Mr. Chappellet has demonstrated to the mining world the continuance of this deep rich channel down the Forest Hill ridge in the Mayflower mine, 15 miles below Damascus.

The success attained by Mr. Chappellet in discovering *the channel* at such a distance below gave confidence in its existence and extent and encouragement in localities above. After an examination of the surface indications, the lava cap inside the high rim-rock, and a correct knowledge of the developments in the Mountain Gate mine, and with all the resources needful to back their confidence, the French company struck the channel rich in the Golden River mine at Red Point, two miles above Damascus. This definitely settles the question in regard to one of the deep original ancient channels in the Middle Fork Divide.

Lava Indicates the River Course.

It is not claimed by this theory that the presence of lava at any given point indicates an underlying ancient river channel; but it is earnestly maintained that a continuous flow of lava for a long distance in a definite course, from half a mile to a mile or more wide, and several hundred feet in depth, within confined bedrock walls, positively indicates approximately the course of the ancient rivers, whose channels are buried hundreds of feet beneath. As branches from the trunk of a fallen tree, lateral spurs may project on either side and form considerable deposits at the junction of some tributary or low depression, but these are off the course of the main flow and are easily distinguished from it.

The Distinguishing Characteristics

Observed in regard to the ancient and modern or secondary deposits are in the ancient deposits a continuous deep channel of a circumscribed width, varying from 300 to 700 feet, within which is found a regular compact stratum of gravel and bowlders on the bedrock, from 1 to 15 feet in depth. The gold is generally fine and the pay uniform in this stratum, which, in the portion of the gold belt here considered, is covered with debris, cement and lava from 500 to 1000 feet in depth.

The surface indications of these deposits are the overlying cement and lava with the bedrock points projecting at right angles from the main ridge.

The modern or secondary deposits, as a rule, are to one side or the other of the main ridges, and are distinguished by their great extent in width and depth in many places. The formation is irregular and composed of all kinds of material found in the surrounding country and deposited in irregular strata of bowlders, gravel, sand and pipeclay to the depth of from 100 to 300 feet, and in the extensive basin-like deposits, are capped with from 50 to 100 feet of fine gravel.

In this class of deposit the gold is very fine and intermixed in certain strata, some of which are 100 feet or more above the bedrock, while some of the intervening strata are entirely barren. It is obvious, then, where the gold is distributed through the deposits in this way that they can only be worked by the hydraulic process. There is another class of the secondary deposits where the channels are narrow and the overlying material not so wide or deep. In this class the gold is generally coarse, and found in crevices and spots. In some localities, strata of gravel are found, high above the bedrock, containing coarse gold.

The Surface Indications

Of this class are: They generally run on a direct course between parallel bedrock points, from where they break off into some modern canyon or river, to where they unite with the main ridge at a considerable angle. The lava frequently extends some distance from the main flow out over these lateral deposits.

To review, the practical points are, the tributaries coming from various directions in the mountain section united somewhere about the upper border of the gold belt and formed the main continuous rivers in the Pliocene period; and by the steep grades in the mountain sections, the greater portion of the gold was carried down into the gold belt, where all of the conditions were favorable for concentrating and retaining it in the original Pliocene channels. The regular deposits in these channels may be compared with the true fissure mineral veins which do not run out or diminish in contents, while the irregular secondary deposits are compared with segregated and pocket veins, which, though often very rich, cannot be relied on as permanent.

The Term "Divide,"

As used here, implies one independent river system of the Pliocene period, disconnected from any other, the same as the present rivers. In comparing the Middle Fork with the North Fork divide, we find a very striking resemblance in general outline and conformation of the country up to a certain point, above which each divide has its own local peculiarities. The Middle Fork divide is separated into two main ridges by a bedrock country through which Shirt Tail canyon runs. The North Fork divide is separated in exactly the same way by Bear river.

About Spring Garden, on the Forest Hill ridge, the gravel deposit runs up under the lava. About 12 miles distant to the northward the same conditions are observed on the Iowa Hill ridge at Iowa Hill. From these distant points, in a continuous course, the two lava capped ridges converge to a certain point above and unite on the main divide, which is not more than a mile in width. A complete parallel to this is found on the North Fork divide, where, at Bogus Point, on the Sheep Run ridge, the gravel crops out from under the lava; and about 20 miles to the northwest, on the Nevada ridge, the extensive gravel deposit at Blue Tent runs up and dips under the lava cap on that ridge. From Bogus Point on the south and Blue Tent on the north, the two lava-capped ridges on a continuous course converge to a certain point above, where at one time they were evidently connected at Bear valley.

All the conditions and developments are so well known on the Middle Fork divide that it is unnecessary to refer to them further in comparison, and as all of the conditions are of the same character throughout the whole western slope of the Sierras, we conclude as is the Middle Fork divide so are all the other lava-capped divides.

In this article I have endeavored to

Outline a Systematic Theory,

By which all of the apparently mixed up and conflicting parts can be made to harmonize and form one comprehensive whole. It is the result of my personal observation and experience as a practical miner for nearly 40 years, and is based on observed facts and natural methods. In regard to the facts, I challenge an examination by any mining expert or scientist. As to the correctness of conclusions, I leave the practical progressive miner to decide.

The extensive, unexplored and unprospected section of country is the ridge extending from Bogus Point to Bear valley. This section occupies a position right on the gold belt, covering nearly its entire width from west to east, with rich drift mines both north and south of it. Here are present all of the favorable surface indications and surrounding characteristics of those lava-capped ridges where rich drift mines have been struck and are now being worked. No mining section in the State possesses anything like the same facilities of access for travel and transportation of supplies, as the C. P. R. R. runs on this ridge nearly its entire length.

(To be Continued.)

DEATH OF GEORGE T. COULTER.—George T. Coulter, a well-known mining operator, died at St. Mary's Hospital, on Tuesday morning, after a long illness. The deceased was born in Baltimore, Md., in 1842, and after coming to this State, engaged in mining pursuits. He soon acquired prominence as an organizer of large enterprises. His last venture was in the Consolidated Esmeralda mine in Aurora, which he succeeded in placing upon the London market.

THE sum of $252,370 was disbursed in wages to employes of Comstock companies during the month of July. Of the total sum, the Con. Cal. and Virginia office paid out $49,236.75.

San Bernardino County.

Its Mineral and Other Resources.

NUMBER VI.

[Written for the PRESS by JAMES H. CROSSMAN.]

Valleys.

Of the 23,476 square miles of territorial possession confined within the boundaries of the San Bernardino county lines, we find lying south and inclusive of the mountain range of that name 6000 square miles, as previously stated, which is subdivided as follows: South of the range, mountainous land unfit for cultivation, 5297 square miles; land susceptible of cultivation, 703 square miles. North of this range, in the so-called desert regions, an area of 17,476 square miles is subdivided as follows: Valley land, 11,651 square miles; mountainous land, uncultivated, 5825 square miles, making a total of of 23 476 square miles.

Of the irrigable valley lands, 256 square miles contain alkaline, saline and borax deposits. Of these there are 216 square miles of alkaline and saline beds, and the balance is made up of borax-fields.

Of that portion designated as valley land, at least two-thirds is irrigable less the saline and alkaline bedded deposits. This leaves 7511 square miles which is irrigable and susceptible of cultivation by utilizing the waters of subterranean channels through the medium of artesian wells and a system of storage reservoirs for irrigation purposes.

It is a well-established fact known to all "desert men" that an inexhaustible supply of pure water can be obtained from most any of the dry lakes by sinking but a short distance from the surface. The salt, borax and soda beds contain incalculable stores of wealth of such extraordinary richness that the product is freighted by wagons long distances to railroad for transportation to a market.

Leaving the Fertile Valley

Of the south for the desert region of the north, we cross the San Bernardino range of mountains through Tejon Pass at an elevation of 2927 feet. Descending its northerly flank, we enter a broad and extensive valley, whose lowest depression is 2670 feet above the sea level. The valley at this point is not only bisected by the California Southern railroad, but the Mojave river crosses it and enters the desert region proper through the gate at Victor. This low depression or trough is known as the

Rabbit Spring Valley.

Victor, Ord, the Lava Bed range and several other unimportant and detached ranges form the northerly bank, while the San Bernardino and San Gabriel ranges bound it on the south. Its longitudinal extent is from Mojave Station on the northwest to the Colorado river on the southeast, reaching the river at points opposite Ehrenburg and La Paz that lies on the east side of the river in the Territory of Arizona (a distance of 230 miles). Its width varies from 20 to 40 miles. This valley is not continuous with a regular grade, though the mean of the gradients between the two terminal points is 11.40 feet to the mile. Mojave is 2750 feet above the sea level, while the Colorado river shows an elevation of 127 feet at the point designated.

Dry Lakes.

In this distance there are many basin-shaped depressions of considerable area, surrounded by a rim rock. These depressions are known as "dry lakes." They have been formed from the effects of volcanic action, the lava flow from extinct craters having dammed and obstructed the river's flow at a period contemporaneous with the volcanic outburst that occurred in this region. At later periods, these and other volcanoes broke out afresh and assisted in filling the beds of these newly-formed lakes. The soil of the valley is wonderfully rich in fertilizing qualities, formed from the wash of the mountain ranges on the south, and the disintegration and decomposition of the eruptive rocks on its northerly bank, a combination of lime, soda and decayed vegetation. There is no portion of the valley where water cannot be obtained by sinking from ten to 100 feet, and there can be no question but what artesian water can be procured at greater depths.

The Formation and History

Of this extensive valley is simple and easily understood. At a period anterior to the previously mentioned volcanic outburst that changed the topographical features of this whole region, the valley or trough between the two ranges formed the bed of a river of considerable magnitude. In fact, this was Amazonian in its proportions, and received its source of supply from the far north, with numerous streams and tributaries flowing from the mountain ranges through which it coursed for hundreds of miles from its source, in a southerly direction, skirting the Sierra Nevadas on the west to a point near the boundary line of Mono and Inyo counties, Fish Spring and the White Mountain range. This point was the focus of violent volcanic activity that occurred at no very remote period in the history of the world. The resultant effects of this display of subterranean volcanic forces are here seen in every direction; extinct volcanic cones of mammoth proportions built up from base to summit of the material of their own production form miniature mountains, and isolated volcanic peaks surrounded by large areas of lava, scoria, volcanic glass, tufa and other eruptive products. The center of this disturbance occurring in and on both sides of the river's bed, destroyed its integrity, filling the valley through which it coursed from summit to summit, forming a dam of immense proportions, which in turn formed large and extensive lakes, of which Walker lake remains in evidence. The line of disturbance extending northerly from this point, produced similar changes and obliterated all traces of what was at one time an extensive river.

From the dam referred to at the head of Owens River valley it flowed on its course uninterruptedly in a southerly direction, bounded by the Sierra Nevadas on the west and the White Mountain range and Inyo on the east. The latter, geologically speaking, is formed of the oldest rocks on that portion of the continent west of the Rockies; thence via Owens lake through that extensive valley known as Salt Wells, where the flow of this ancient river was again interrupted by a cross-range of eruptive rocks which formed the dam that flooded and formed the last-named valley; thence to Mojave Station; from there to the Colorado river, a distance of more than 400 miles from the dam referred to on the boundary line of Inyo and Mono counties. In corroboration of

The Theory of the River Channel

That I have advanced, W. A. Goodyear, Geologist of the State Mining Bureau, was much puzzled to account for the immense quantity of water-worn gravel and bowlders that he saw during his examination of that region. I quote his own words from pages 273-4 of the 8th annual report of the State Mineralogist: "The material consists of sand, pebbles and water-worn bowlders * * many of them large enough to weigh from one to 20 tons each. They are scattered far and wide. * * It is impossible to understand how ice in any shape could have produced a distribution so uniform, * * nor could the water of any lake or sea have spread the debris in such a way."

The problem would have been easily solved if the river theory, accompanied by a local upheaval, had occurred to him.

I have digressed and left the county under discussion, but the subject is an important one. It was necessary that I should attempt to show that such a river as I have described at one time existed. Its bed yet remains and is the recipient of the water of an immense watershed. Though not at date coming to the surface as a living stream, it unquestionably flows through subterranean channels and finds its way to the ocean. From this source, artesian water, under powerful pressure-head and in immense quantities, can be obtained to irrigate the desert lands of this now barren and unproductive valley. The valley from Mojave to the river Colorado is not less than 230 miles long by a mean of 15 miles in width, aggregating 3450 square miles of irrigable, fertile land which would support a large population. No portion of this land has been surveyed or located, unless it is a small strip on the border of the Mojave river, it being Government land, and unless withdrawn under the Irrigation Act, it can be had by the settler for $1.25 per acre. I have more particularly described this valley as a type of a large number that exist in these desert regions, that are similarly situated. To enumerate and describe them all would fill a volume.

I have thus briefly described the lands of this arid region that require artificial appliances for irrigating purposes (storage reservoirs or artesian wells). I will, by way of illustration, show what can be done with similar lands that receive their supply of water from natural sources, viz.: Springs that discharge at the surface.

Pahrump Valley

Is situated on the boundary line between Nevada and California—about one-half of its territory in each. The valley adjoins the Yellow Pine range on the north, to which it lies parallel, coursing northeast and southwest. Its extent is 40 miles in length by 18 in width, comprising an area of 720 square miles.

On Yountz ranch, two springs with a combined flow of 100 inches, miners' measurement, irrigate the ranch, on which there are five acres in fruit, consisting of peaches, apples, apricots and figs, in full bearing, producing large crops of high flavored fruit. There is one acre in blackberries, and there are 2½ acres in vines seven years old, 25 acres in alfalfa (cutting four crops of 1½ tons each season), and 95 acres in barley yielding two tons to the acre. Sweet potatoes are a never-failing crop. Irish potatoes yield from 2 to 2½ tons to the acre.

Wintere Ranch,

Known as the Pahrump, is situated six miles distant, and has 75 acres in barley, 125 in alfalfa, and 20 in fruit of all varieties producing equally as well as the one first described, with never-failing crops. The atmosphere is so dry that grain can be stored and preserved in cribs for several years without deteriorating. This ranch is also supplied with an abundance of spring water for irrigation purposes.

The Death Valley Basin

Is in Inyo and San Bernardino counties—much the larger portion being in the latter. Its area is 180 square miles—60 long by 3 in width.

The surface of this basin is covered by an

earthy, pulverulent, ashy-gray substance containing a large percentage of sode, salt and borax, forming, as a rule, separate and distinct beds. Large areas are covered by an efflorescence of these crystallized minerals of a dazzling whiteness. This, combined with the caustic-heated dust that rises from the bed, affects the eyes of the traveler to that extent that he is compelled to use protective measures while crossing it. The alkaline, saline and borax products of this basin set an important figure in the mineral resources of the county. They will be described more particularly under the head of "mineral districts." The basin is superficially covered by these powerful mineral substances, but in many places on its had fresh and drinkable water can be obtained by sinking from 8 to 20 feet, where a stratum of a hard cemented earth is reached, called "the hard pan," usually from 2 to 3 feet in thickness. Below this, fresh water is found. The basin is said to lie from 100 to 200 feet below the level of the sea, but of this no accurate determination has ever been made. This valley is a type, on a large scale, of many others in this region of smaller dimensions.

Borax Lake

Comprises an area four miles in length by half a mile in width. Its surface is covered by a boracic efflorescence and the water below the surface is highly charged with this mineral, which is being utilized by and belongs to Messrs. Searles Brothers. Their refinery is in the vicinity at the head of the lake, which is situated in township 19 N., range 41 west, M. D. M.

Crystal Salt Valley

Lies 27 miles S. E. of Danby, 4 miles S. E. from the southerly end of Old Woman's mountain and 50 miles from the Colorado river, at an elevation of 600 feet above the level of the sea. It forms a basin-shaped depression of 4 by 10 miles in extent. The central portion is 5200 feet long by 2600 feet wide and is covered by a saline efflorescence. Below this crust are found prismatic crystals of great beauty and transparency which are highly prized by scientific institutions and mineral collectors for cabinets, as they do not deliquesce on exposure to the atmosphere. They occur in a solid bed of crystalline salt of unknown depth and extent. Its product is mined by open cuts and hauled in freight teams for a distance of about 30 miles to Danby, for transportation by rail to a market. Of the many unenumerated valleys of extent and importance in these desert regions, we find Soda Lake, noted for its alkaline and saline product; Chimbneva for its agricultural character, and Bear and Holcomb valleys for their immense gold-bearing ledge.

(To be Continued.)

The Bodie Mines.

The Standard mine at Bodie is taking on a new life under its new superintendent, Arthur Macy, and promises to again be the "old reliable" mine of all this section. He has made a new departure in the working of the valuable ores of that mine by putting in two Frue concentrators to reduce the expense of milling and, at the same time, obtain close results. While the mill, under the new management, has been running only about ten days, it is considered by all interested that the new process in the milling of the Standard ores is a success, although no "cleanup" has yet been made; but Mr. Macy is so well satisfied with it that he has ordered three more concentrators, which will give him five—sufficient to give work for the 20-stamp mill of the company. The success of the Standard under its new management will be an incentive to other companies, notably the Bodie Tunnel, which has also been placed under the management of a thorough miner—Supt. J. R. Ryan, formerly of the Comstock—to inaugurate the same system of reducing their ores and place the Bodie Tunnel on the list of paying mines, as it is well known that it has plenty of ore awaiting a cheap and thorough process of working.

Mono county, which has poured millions of gold into the commercial marts during the past 12 years, has not been half prospected for its mineral wealth, and many prominent mines have been idle for years awaiting a cheap system of ore reduction which will enable them to take on a new lease of life, be productive and a joy to their owners, if Supt. Macy makes a successful "cleanup" of his present workings, and demonstrates the fact that our ores can be worked closely and economically.—*Chronicle Union.*

NEW REDUCTION WORKS.—The erection of a $70,000 gold extraction works has begun at Grass Valley. The main building will be 107x47 feet. The principal factors of the plant will consist of two sets of Krom's 26-inch steel rolls with crushers, two roasting furnaces and six two-ton chlorinators of the Pollok patent, with other necessary machinery. The rolls and crushers will reduce 30 tons of ore per day, and the chlorinators will treat 200 tons per week, on the basis of ten tons daily. Water will be utilized for what power is desired, two water-wheels having been ordered. The works are being erected by the Grass Valley Extraction Co. of Edinburgh, Scotland, and a representative of the company is now superintending operations at Grass Valley. If found necessary, a smelter will be erected later.

Black Sand Mines.

Gold on the Ocean Beach in Santa Cruz Co.

"Would you kindly direct us to the Black Sand gold mines?"

It was in the village of Aptos, on Friday morning of last week. The speaker was M. H. Hyland, and his companion was a representative of the San Jose *Mercury*.

"They're taking out a good deal of gold down there, ain't they?"

"Oh, yes. I am told they've got a good thing," responded the lawyer without cracking a smile; "but could you tell us how to get there?"

"Where do you want to go—to Cope's or to Raymond's?"

"To Raymond's," was the answer, given at a venture, for neither of the gold seekers knew anything of Cope or Raymond, nor the mines, except that they were taking gold from the beach sands somewhere down the coast, not very far from Aptos.

"Want to go to Raymond's, do ye? Well, now, if you could only get down to the beach here, it would be easy enough, but you can't, cause the gate is locked. You might get the key from Slawson, though. No," he added after a minute's reflection. "Ye can't find Slawson; he went up into the mountains this morning. You'll just have to go around by San Andreas."

"How's that?"

"Well, you just go down the road past a white house, and then you turn to the left and go about three miles, and then you turn to the right and go four miles and pass a barn, and thee you go through a gate and across a field and down a big gulch and under a bridge, and pretty soon you'll come to the mine."

"How far is it?" asked Mike with a groan.

"About nine miles that way. If you could get on the beach, it wouldn't be so far."

The gold-seekers were in for it, and while they had but faint hope of following the directions, they were bound to try, and pushed on.

They succeeded more easily than they expected, and after an hour-and-a-half's drive over sandy, hilly roads, they passed a barn, opened a gate, went through some fields, descended an almost impassable gulch and followed its course until it passed underneath a high railroad bridge, and on the beach just beyond, came upon the camp of F. H. Hansmann and F. Raymond.

These gentlemen and two machinists from Santa Cruz were busily engaged in putting in place a small engine and concentrator, but they cheerfully passed long enough to receive and answer the numerous questions of their visitors. Said one of them: "You know that the black sands of the beaches of the Pacific ocean in many places carry considerable gold, but it is so light and fine that in most cases it is impossible to work it profitably by ordinary methods. People have been experimenting with the sands here for the last ten years, but for the most part without any great financial success. One lucky individual, with ordinary sluices and riffles, did take out $22,000 from under that bridge, but he struck a remarkably rich deposit."

"You say that many efforts have been made to mine the less rich sand without profitable results; on what do you base your hope for better success?"

"On the fact that I believe we have at last succeeded in obtaining a concentrator that will save the gold," pointing to a machine standing at a little distance from a ten-horse-power portable engine. "This," he continued, "is the invention of Woods & Garcelon at Santa Cruz. We have experimented with a smaller machine, and are satisfied it will do the work with five men, four horses and two common road scrapers. We expect to work from 80 to 100 tons of sand a day."

"How much gold do you expect a ton of sand to yield?"

"We expect to be able to save an average of from 75 cents to $1 a ton."

"What is the depth and extent of the black or gold bearing sand?"

"Its extent we cannot tell. We know that it is found all the way from here to Aptos wharf. We do not think it extends far under the bluff, though Cope's mine, below here, is more than a mile inland, and the sand is brought up from a shaft. The black sand is from two to three feet below the surface of the gray sand and is a stratum of from three to four feet in depth. It will be easily worked, as we will strip the gray sand off with a common road-scraper and convey the black sand to the concentrator in the same way."

At the request of the visitors, one of the men went to the edge of the bluff, and, after digging a hole two feet deep, took out a shovelful of the sand and washed it (upon the shovel) in a seepage pool on the beach, the result showing a multitude of tiny specks of gold, indicating a wealth at that particular spot far in excess of the 75 cents or $1 a ton spoken of.

The miners expressed a belief that they would have their machinery in operation during the afternoon and invited their visitors to remain and witness the experiment, but the time could not be spared.

Upon the advice of the miners the visitors on their homeward trip followed the beach line as far as New Brighton (a mile this side of Capitola) where the high bluff can again be reached, the return being made with much more comfort and in a third of the time occupied by the outward trip. This is a fact that possible future visitors will do well to remember.

On the Ridge.

River Mining to Boom.

In conversation with Mr. C. H. Mitchell on Thursday, says the Grass Valley *Tidings*, we gleaned a number of interesting observations made by him on his recent trip to the Ridge in behalf of the Mining Department of the Census Bureau.

Mr. Mitchell stated that he was astonished at the extent to which the Yubas have scoured during the winter and spring. At Bridgeport, where last fall a bowlder projected out of the river-bed two or three feet, the scouring process has been so decided that from 12 to 15 feet of the immense rock is now in view. In other places he noted that the bed had scoured out, where the current was strongest, to a corresponding depth, and was credibly informed that opposite Marysville the bed is now a foot and a half higher than it was last fall. There are untold thousands of tons of debris yet to be carried down, so our Marysville friends will be obliged to continue the work of raising and strengthening their levees. This is to be deplored, but it cannot be prevented.

Our observing brother editor was very depressingly impressed with the absolute "deadness" of the once prosperous and numerous towns of the Ridge. This is a direct result of the war on hydraulic mining. There is no question but that there are millions of dollars of gold hidden in the great gravel banks, and hydraulic mining is the only feasible method of getting at the treasure. Some day, and not far distant we believe, a wealthy syndicate will buy up these abandoned claims and construct a great flume from the center of the scene of their operations down through the foothills to the tule lands in Yuba and Sutter counties. Hydraulicking will be resumed full blast, and through this flume the debris will be washed into the tule wastes, strengthening the levees and converting thousands of acres of the tules into fairly good land. Riffles will be placed throughout the length of the flume and annual cleanups of the float gold thus caught made. This source of revenue, as all hydraulic miners will admit, will prove an important one. The valley people are not such fanatics as to oppose a project so obviously beneficial to them directly and *indirectly*.

In all fairness the State should take up the flume project and assist in carrying it out. The laws of the land have ruined thousands of her best citizens in suppressing hydraulicking, and if reparation can be made it certainly should be. Agriculture and horticulture are assisted by the State and the miners should likewise be encouraged. It is conceded that California has experienced a period of comparative depression since Judge Sawyer's anti-debris decrees have been enforced. Could anything else be expected when the gold circulation was by one fell blow diminished so materially! That it would be to the interest of farmer, merchant and miner alike to forward any project looking to the accomplishment of such an end is too plain to be discussed. That the project is feasible is apparent.

The Mining Bureau Museum.

The following are among the recent additions to the State Mining Bureau Museum:

Number of rich specimens of silver ores from Montana, from J. Z. Davis and C. W. Leonard.

Gold quartz from Siskiyou county.

Ouvarovite, Shasta county, H. Williams.

Gold quartz, several specimens from Shasta, Tuolumne and Fresno counties.

Large number of coal, iron, copper and other specimens of economic interest from the Eastern States.

Very fine ancient stone ax, Arizona, John H. Ordway.

Rich silver ore, Sonora, Mexico, E. M. Railton.

Melanterite, Petaluma, Cal., Ben C. Hessletine.

Very fine crystals of magnetite, Lake Champlain, N. Y., John Birkinbine.

Chromic iron (several localities), California, D. M. Miller and others.

Pisolitic limonite on chalcedony; dogtooth spar on conglomerate; smoky quartz crystals, phosphate of lime, epidote, garnets, etc., from W. Q. Mason, Volcano, Amador county.

Building stone, Ione, D. O'Neil.

Native mercury on cinnabar, New Almaden, J. B Randol.

Columbite, Etta tin mine, South Dakota.

ANTIMONY AND GYPSUM.—A correspondent of the *Silver State*, writing from Lovelocks, Nev., says: Antimony is being mined considerable. Mr. Senn, who has mines producing this metal near here, and who worked them some two or three years ago, has returned and with him Mr. Edwards, a representative of a company which will purchase the property upon a favorable report by Mr. Edwards. However, whether the mine be sold or not, it will be worked and the ore either reduced on the ground or shipped to California. Thies & Hutchings have shipped three cars of antimony to San Francisco; that metal being high makes those mines valuable. H. J. Bender is also having antimony hauled for shipment. A San Francisco company is about to purchase the gypsum deposit lying about four miles west of town, and if the purchase is made will commence shipping by the 20th of August, and calculate on handling 600 tons per month, there being mountains of the sulphate in sight.

THE BIG TREES.—Gov. Waterman has received a dispatch from the Secretary of the Interior in which he says: It is not true that the lands you mention are about to be open to survey. The sequoia gigantea has been protected by a very recent decision of this department and orders to reserve all of the ground upon which they are growing, both in Tulare county and in Yosemite, for the latter of which, as you state, a bill is pending in Congress. I have written you this day showing the full correspondence on this subject, which is most positive and energetic in defense of the sequoia gigantea.

The Irrigation Surveys.

It is difficult to learn yet the fate of the irrigation work at the Government expense. So far telegrams seem to indicate the likelihood of the withdrawal of the appropriation for the continuance of the work under the Geological Survey, as both the House and Senate have acted thus far in that direction.

There seems to be a serious conflict in the statements put forth as to the character of the reservation of public lands under the Act of 1888, to which allusion has been previously made in these columns. For example, Senator Dolph of Oregon writes to a Portland paper as follows:

"It has been construed by the Attorney-General and Secretary of the Interior as withdrawing all irrigable lands of all the arid region from the operation of the land laws without any action of the department, and it is held by the department that, as the irrigable lands cannot be segregated from the arable lands without a survey, the operation of the general land laws in all the arid region is suspended, not only as to irrigable lands, but as to arable lands, timber lands, etc.

"This region, as marked out by Major Powell and adopted for the action of the Interior Department, is substantially bounded on the north by the Dominion of Canada; on the south by Mexico; on the east by a line drawn nearly through the middle of North and South Dakota, Nebraska, Kansas and Texas; and on the west through Oregon and Washington by the Cascade mountains; and through the upper part of California by the Sierra Nevada mountains to about the latitude of Santa Cruz, from which point the Pacific ocean is the boundary, being a tract of land containing approximately two-fifths of the area of the United States."

Such a reservation of public lands from settlement naturally would awaken the strongest opposition from representatives of sections which depend largely upon the settlement of adjacent public lands for their development, and suggest the conclusion which they freely make that the Texas representatives relish that because Texas owns all her own unoccupied lands, and to shut up Uncle Sam's real estate office would send customers to the Texas land-dealers. But this conclusion does not seem to be a fair one if the statement attributed to Secretary Noble in the following telegram is the true one:

"An answer to inquiries regarding the irrigation surveys contained in the recent Senate resolution was sent to the Senate to-day by Secretary Noble. He states that the Director of the Geological Survey actually surveyed and marked the boundaries, and that the areas of the sites for reservoirs were by him selected under the Act of 1888, and that the tracts so segregated were so marked that they can be discovered on the ground and delineated on the Land Office maps.

"In the reservoir site selections only so much land has in each instance been reserved as is intended to be used for storage of water. It was not intended, the Secretary says, that the surveys and selections under the Act of 1888 should be carried to the extent of planning a system of canals, ditches, checks and furrows for the distribution of water over farms, as it was deemed that people, when they come to cultivate these lands, can better do this themselves.

"The general purpose and plan of the department, the Secretary says, is to preserve the sources of water supply from the possession or appropriation of individuals or corporations. It is believed, he says, that it will be the duty of his Department, so long as this statute remains, to enforce it, that its fruits, at least in the preservation of the sources and reservoirs of water, may be kept under either national or State governmental control."

This would indicate that only sites suitable for actual use in the storage of water are reserved and they are clearly marked on the land office maps, and that the claim that "two-fifths of the area of the United States" is locked up is not true. Probably a little more time will straighten out these matters.

A MONSTER IRON GIRDER.—One of the two immense 70-ton iron girders which are to span the assembly hall in the McAllister-street wing of the City Hall has arrived, and has been brought to the McAllister-street side of the building. The girder was built by the Keystone Bridge Company of Pittsburg, Penn., and is the largest ever constructed in the United States, so far as known. It is 105 feet long, and is built of wrought steel plates riveted together.

ANOTHER shipment of bullion, valued at $27 927 46, has been made from the Con. Cal. and Virginia mine to the Carson Mint, making total shipments of $119,578 93 to July account.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

ECONOMICAL WORKING.—Amador *Ledger*, Aug. 6: At Herman Tripp's claim on the Mokelumne river, a short distance above Big Bar bridge, the first cleanup of the mill running on ore taken from a new ledge just opened, was made last week, and yielded the satisfactory sum of $1740. The total running expense was $725, or 61 cents per ton for mining, hauling and milling. This we believe breaks the record of economical gold mining. The run amounted to 1200 tons, yielding an average of $1.45 per ton. Such ore is generally looked upon as worthless for practical purposes, but here it is made to yield a profit of over $1000 on the month's run. Tripp says he would not wisb anything better than $2 rock, and plenty of it.

Inyo.

SYLVANIA.—Inyo *Index*, Aug. 6: J. J. Gunn and Arthur Smith returned from inspecting mines and mining prospects at Sylvania last week. Mr. Gunn tells us that there is in that district every indication favorable to the building up of a large and flourishing camp. At present there are about 70 men in the vicinity, and it is probable that this number will soon be largely increased. The Liberal and Climax mines are those which are attracting most attention, the bond having been extended to August 14. There are 700 tons of ore on the Liberal dump. The Great Western, State Line and Hazel Green mines, belonging to Buser & Son, have been worked to a depth of 100 feet. For a new camp the showing made is excellent.

BIG PINE.—Teams went to Saline Valley last Friday to commence to baul out borax once again. Shober & Son will put on two 10-animal teams, Hall Bros. one 8-animal team, and June Smith one 8-animal team. Before fall there will be some more teams put on. We are informed by Conn & Trudo that they are now making about 60 tons of borax per month. Sam Piper and Chris Engle have purchased the 12-foot overshot water-wheel from the Campbell estate and J. Y. Ashmore bauled the same out last Friday to Fish Lake Valley. It will be put up at Piper's mine to run his arastra. May success ever be with them.

PANAMINT.—Cor. Inyo *Index*, Aug. 6: H. G. Chickering has been busy for the last two months on bis Oroville mine and has struck a fine body of high-grade ore, of which be is now taking out considerable quantities. The Wyoming has been leased to Rose, White, Curran & Co., who for a month bave been making extensive preparation for future working. There is a rumor to the effect that capitalists are making arrangements to work the Wild Rose antimony mines upon a large scale. At Panamint a large ledge, called the Anaconda, has lately had some work performed upon it. A shaft of 60 feet in depth has been cleaned out; two tunnels which were covered up by debris, which for years had slid down the mountain-side, completely hiding their existence, have been reopened, exposing several bodies of fine ore; one nearly six feet wide averaging 48.34 ozs.; one from four inches to a foot of 103-oz ore; one 98.70 oz.; one 18 inches of sulphurets assaying from 29 to 65 ozs. Wherever work was done to clean out the old workings, ore was encountered which could be advantageously manipulated. The Anaconda mine can be traced for a long distance. It stands almost perpendicular, lying in a hydro-mica schist formation, the same apparently being the formation underlying the silurian rocks that most of the mines of Panamint district are found in. The Anaconda being in an older formation has every indication of becoming a fine piece of silver-producing property. The ledge is over 20 feet in width and has been very appropriately named, as it is a veritable Anaconda, for innumerable ledges seem to be drawn toward its folds. A short time ago, parties in the interest of an English syndicate were examining mining property in the vicinity of Panamint, Indians at Gold Hill are mining gold, packing the ore three miles and working it in arastras. There is every prospect of the Surprise M. & M. Co. resuming operations before long.

Nevada.

EMPIRE.—Grass Valley *Union*, Aug. 2: Supt. Starr informs us that there is a great improvement in the Empire of late. There is a large and valuable ledge in the bottom, and it gets better as the 19th level is reached. An additional force of men was put to work in the mine yesterday, and now counting tributers and all there are about 130 men employed in the famous old mine.

RICH ORE.—For the past four or five days some very rich ore bas been coming out of the North Star mine from the 17 drift west. The ore that has come out of that drift lately is very valuable and many specimens were brought to the surface that were too rich to be put through the mill. The North Star is looking well.

PASSED THE DIVIDEND.—Yesterday the Idaho M. Co. held its regular monthly meeting at the office of the secretary. It was decided at the meeting not to declare a dividend this month.

THE OMAHA MINE.—Grass Valley *Union*, Aug. 6: Supt. George Mainhart stopped the underground work in the Omaha mine yesterday in order that the shaft migbt be repaired and the landing raised. In the meantime, quartz will come through the shaft of the Lone Jack. There is quartz enough to keep the mill running about two weeks, and it will require about three weeks' time to repair the shaft. No men will he idle on this account. The Omaha is looking well in all its working apartments.

GOLD HILL MINE.—Work is going steadily along at the Gold Hill mine. The shaft has now been cleared to the depth of 140 feet. It was very badly caved, but has been put in first-class repair. Geo. Mainhart, who has charge of affairs there, thinks that they will strike water in about 20 feet farther, then pumping will be commenced.

ST. JOHNS MINE.—*Tidings*, Aug. 6: The water is now out of the St. Johns shaft, and sinking has been commenced by three eight-hour shifts. It is proposed to sink about 50 feet without delay, when the sbaft will be on a level with the deepest old workings. A drift will then be run to connect the two shafts, thus affording good ventilation and a means of escape in event of accident. Then, too, it is known that there is a vein of excellent ore in the bottom of the old shaft. The hoisting and pumping plant is of power sufficient to enable operations to a depth of 500 or 600 feet, and has been very substantially erected. The building and works, in short, constitute a model for other structures and plants, having been designed witb a view to provide maximum conveniences and accommodations. Everything works smoothly, and the job as a whole reflects infinite credit on Messrs. Carr & Son, tbe millwrights and builders.

THE NICHOLS MINE.—Work has been commenced on the Nichols quartz mine, bonded by H. B. Nicbols to the syndicate, represented by Judge Calkins of Chicago, for $50,000. Mr. Nichols has taken a contract to open the drain tunnel, which cuts the shaft at a depth of 50 feet. The tunnel is 900 feet in length and is badly caved. Five men are at work on it. This is the mine in which Nichols took out nearly $20,000 in a few months with one or two men. Grading for hoisting and pumping works will be commenced shortly.

BRUNSWICK MINE.—Supt. Fitzgerald reports that since commencing sinking, the shaft has been put down 22 feet, making a total depth of 282 feet. The ledge in the shaft is from 6 to 18 inches thick and the country rock favorable.

THAT BIG TUNNEL.—*Tidings*, Aug. 5: Francis Burns, who is directing the big tunnel project that is expected to cut the richest ore veins of Nevada and Grass Valley districts at a great depth, is an enthusiast on the future of the mining industry in this locality. The big tunnel company has money enough on band to run for three years to come, in which period royalties from ore veins cut and gold from veins owned by the company and opened up by the tunnel will undoubtedly supply sufficient funds for pushing the work to completion, to accomplisb which it is estimated will require seven years' time. The tunnel, including a 70-foot cut, is now in 250 feet, and compressors and power drills will not be required for several months. At the outset a number of bowlders delayed operations, but now the work is progressing more satisfactorily. The enterprise is now attracting the attention of the prominent mining men of the coast, and if in the course of a year or two expected discoveries are made, there will be no doubt about operations being commenced from this end and the early completion of the work. The company owns 2000 acres of mining ground on the line of the tunnel, including a claim adjacent to the Idaho, on which it is proposed to sink a shaft and from the bottom tunnel to meet the workers from the other end.

RICH ORE AT THE NORTH STAR.—Grass Valley *Union*, Aug. 8: The ore coming out of the stope on the west drift of the No. 17 level of the North Star mine, of which mention was made a few days ago, continues to he of extraordinary richness, the gold being coarse and intermixed with sulphurets of the highest grade. This rich quartz when first struck came in a narrow streak, but subsequently widened until it was 10 inches and ribboned with bands of gold and sulphurets. There has been considerable more ore taken out not so rich in appearance, but yet of a high grade, as evidenced by the fact that 225 ounces of amalgam have been scraped from the plates in eight hours, which would represent a value of about $1000. There has been much rich quartz taken out in the Grass Valley district from time to time, but to our recollection nothing to surpass what is now coming out of the North Star. The location of the rich find is at a point farther west of the shaft than ever before worked. This is very encouraging for a mine that was shut down and dismantled some years ago because it was supposed to have been exhausted of its riches.

Plumas.

ANOTHER MINING ENTERPRISE. — Plumas *National*, Aug. 2: During the past week Messrs. Jas. O'Brien of Smartsville and A. P. White of San Francisco have been in Quincy and vicinity looking at the Plumas Ditch and M. Co.'s property, with a view of making a purchase. The gentlemen returned to the lower country Monday, and we are reliably informed that Mr. R. Thompson of Spanish Ranch leaves for San Francisco next week to settle negotiations with these parties for the sale of the above-mentioned property. This valuable piece of ditch and mining property is situated to the north of Spanisb Ranch, the ditch being over 30 miles in length and the claim for drifting purposes very rich. The estimated value of the old iron in the claim is something over $10,000. When in repair, the ditch water for irrigating purposes alone would yield a handsome revenue. At the close of the purchase it is contemplated to repair the ditch immediately, so as to afford abundance of water to the many miners having valuable claims in the vicinity. The enterprise will create a boom at Spanisb Ranch and Meadow Valley, and as this mining section is exceedingly rich in still undeveloped quartz and drift claims, we note the above with a great degree of satisfaction.

San Diego.

SALES AT JULIAN.—Julian *Sentinel*, Aug. 1: The Richmond mine has in time past turned out some good ore, but, like many others in the camp, has only had the assessment work done on it for several years by J. R. Lowe, the owner. On last Monday it was purchased by Robert Gardner for the sum of $2000. He also purchased a mill-site of W. J. Hastings, whicb is near the property. W. O. Havermale returned to Julian, Tuesday, with the welcome intelligence that the old Helvetia Mining Co. was no more, be having purchased that "troublesome half interest" for $16,000. Mr. Havermale now bas full control of the mine and will push the work of development as fast as money and men can do it. Three shifts were put to work yesterday and the mine will soon he producing ore again. The Fraction and Vulture mines are situated in what is known as the Banner portion of the Julian district, about four miles from the town of Julian. Considerable development work has been done at different times and rich rock has been milled. They join the Cincinnati Belle, wbich was purchased by St. Louis capital some time since, and are also near the Kentuck S. They were purchased Wednesday from Thomas Rowland, the owner, by Waldo S. Waterman and Jerome MacDonald, for the sum of $4000. These gentlemen also own the Cable, in the vicinity of the Fraction and Vulture, and tbey intend running a tunnel across the formation in a distance of 500 feet or more to develop the property. It is expected that this work will commence at once. The names of the owners is sufficient guarantee that it will be done in a first-class manner. The Desert View, Mountain Brow, Julian, Mammoth, City of Richmond, Compromise, Gardner mine (patented) and an accompanying millsite all go at once. The above seven mines constitute what is known as the Blue Hill group of mines, and are located 1½ miles from Julian, and until to-day were the property of Robert Gardner. As we go to press, the papers are being prepared that will transfer the title of the entire group to Gov. R. W. Waterman, tbe owner of the *now* famous Stonewall. This deal means more for the camp than any purchase yet made, the consideration being $50,000. A contract will be let for running a tunnel 1000 feet in length, which will develop this property. Thousands and thousands of dollars have been taken out of the surface of this mountain, and tons of rich ore are now on the dump.

Shasta.

STRUCK IT RICH.—Redding *Free Press*, Aug. 2: Peter Scherer, the original owner of the Eureka tellurium mine, about three miles from Redding, says that recently the company has been clearing out the shaft from which the wonderfully rich tellurium and free gold was taken a few years ago. This shaft was down about 130 feet on an incline, and was last prospected by an expert representing ex-Governor Perkins. After running a short distance and failing to find paying ore, they threw up the hond they had on the mine. But Peter has never become discouraged. He succeeded, with the help of Mrs. L. E. Davis, in organizing a company and for several months has been running a tunnel. Recently they cleaned out the shaft, and upon sinking to a depth of five feet, again found the ledge, some four feet thick and full of free gold. This mine is represented here at the present time by Dr. Isaac Atwood, vice-president of the company, and P. Scherer, treasurer. O. J. Johnson, president, at the present time is in Chicago, This new strike will be good news to those who are stockholders, and is calculated to give the mine a new value in the eyes of the public.

QUARTZ.—Redding *Free Press*, Aug. 4: We learn that Jack Conant bas struck the ledge in the Wheeler mine at Frencb Gulch, and that prospects are bright. Mr. Whitebouse intends to develop the Central mine at Old Diggings, under the management of Mr. Reed, the mining expert. This is good mining property. There were 22 mining men in our city Thursday evening. This shows that our mines are attracting attention in numerous directions. It is reported that the Webb Bros. have made a strike of very rich ore in their new prospect just below the Tom Green mine in the French Gulch district. It is entirely a new discovery. Tom Cummins and a prospector from Frencb Gulch will soon start on a prospecting trip around the base of Lassen Butte. The gold-bearing ore in that region is distinct from any in the State, having a white, soapy, grainless appearance, and the gold occurs in the form of a pink stain. Cummins and bis friend expect to uncover something after the nature of Hayden Hill mine, which is also of a peculiar character and bas yielded somewhere in the neighborhood of $2,000,000. During the past month the Calumet Co. has worked on tests some 300 tons of rock from the company's various mines. The tests have been between the stamp battery with silver plates and concentrators, and the Paul dry amalgamating process, with its accompanying machinery, and arastra working, using the Americanized arastra. We have not been able to get the result of differences, as Mr. Paul declines to give any particulars further than that by the stamp battery you get less than you expect and by the dry way more than you expect.

Sierra.

AT HAPPY HOLLOW.—Oroville *Register*, Aug. 7: J. H. Hogan, who has been in the mountains of Sierra and Butte, says that at Happy Hollow a Scotch Co. were taking out from $20,000 to $28,000 a month. Seventy white men and 40 Chinamen are employed in this mine. A good deal of teaming was carried on, but most of the teams come from Marysville.

GIBSONVILLE.—Cor. *Mt. Messenger*, Aug. 9: All the miners hereabout are at work and the prospect is very promising for a lively mining camp in the near future. Work at the North America drift mine has been temporarily suspended, due to Supt. Schofield being sick in San Francisco. Union Drift Co. are running a prospect tunnel for hack ground, North America Co., Hepsidam, have gravel in their main tunnel 14 feet below the track, making about 74 feet difference in grade of 250 to the old works. Gravel is coarse and appears well on the bottom, but bas not been prospected. Length of the main tunnel about 8000 feet, extending into Plumas county. Mark Schofield has charge of the property during the absence of his brother, Miles, who with Dixon Brabhan of La Porte, own the mine. Average grade of channel from La Porte to the North America drift mine, Hepsidam, is five feet to the hundred, as figured by U. S. Mineral Surveyor C. W. Hendel, who says it is the steepest he has ever had. From Howland Flat to Happy Hollow, grade is three feet by same authority. This is interesting as against four feet to the hundred grade in the Bald Mountain and Extension channel in the Pliocene ridge above Forest City.

Siskiyou.

PINERY DIGGINGS.—Yreka *Journal*, Aug. 6: A gentleman named Deming has recently purchased considerable mining ground at the old Pinery diggings in Scott Valley, and has bonded the Wright & Fletcher and Eastlick mines at Oro Fino, besides investigating the Campbell mine of Quartz Valley and several other valuable mines in Scott Valley and the vicinity, with the same object in view. There is a vast extent of mining property of great value in the entire country from the line of the C. & O. R. R. westward to the valleys of the Pacific seaboard, which only need capital, machinery and labor to develop them to big paying advantage.

Trinity.

NEW RIVER.—Cor. Humboldt *Mail*, Aug. 6: The camp is recovering from the severe winter and those mines being worked are looking well and get better as they go deeper. The Boomer seems to be now in a solid formation and the ore is very rich. The Excelsior has a large lead of good ore in sight, also the Hidden Treasure. The Tough Nut is also furnishing considerable bigh-grade ore. The Uncle Sam looks better than ever and the ore is higher grade. The owners have a new boiler on the way from Eureka, built by Langford Bros. They will probably be crushing within 30 days. Two different parties have a lease on the Sherwood mine, and are taking out some very rich ore. The Ridgeway Co. are about contracting for the completion of the upraise to connect with the old works, where they left very high-grade ore, There is considerable excitement here in regard to the big ledge on Virgin creek known as the Junction, and from present indications it is the biggest thing in the way of quality ever struck in California. The ledge crops out from 50 feet to 300 feet in width and for over 2000 feet in length. Nearly all of it prospects more or less in free gold. I have many $20 prospects. It is pure quartz and highly mineralized. The company, while running a tunnel into this mountain of ore, find a large body that only shows light prospects in free gold, but an assay by Mr. Kustel of San Francisco gives the value of the ore at $113.28 per ton in free gold and sulphurets, I hear good reports from Know Nothing camp, lying just beyond, also from Black Bear.

Tuolumne.

SOLD.—*Independent*, Aug. 9: The Stanislaus gravel mine near Byrns' Ferry was sold last week for $10,000, on a bond of $1000. This mine, the property of Haggin & Hearst, was sold to a Mr. Wheaton, who has already commenced operations. The property, as a gravel mine, is spoken of very highly by mining men, and several parties have of late years bonded the mine, but financial embarrassment overtook them. Mr. Frank McCann negotiated for the sale of the mine for some time, and did succeed, several years ago, in bonding it. The mine was owned by Thos. Evans and sold to Haggin & Hearst for $7000 about 16 years ago. Mr. Evans recently bought the extension.

NEVADA.

Washoe District.

BELCHER.—*Alta*, Aug. 14: The 200 north drift from the west crosscut advanced 13 feet during the week, making its length 192 feet. The face is in a mixture of clay and porphyry and streaks of quartz. The 300 west crosscut from the shaft was extended 15 feet, and is now out 506 feet. The face is in clay, porphyry and low-grade quartz. The 1300 east crosscut is out a total distance of 254 feet. The face is in soft porphyry. The 1300 joint winze is down 67 feet, having been sunk 19 feet, the bottom in low-grade quartz and porphyry. The 1400 south drift is out 80 feet, in porphyry and clay. Have opened the 1000 stope nine sets long by two wide. Will raise the second floor shortly. The 300 stope is up 10 floors from where it was started, and looks well in the top. Shipped to the Vivian mill during the week 274 tons 630 pounds of ore, the average battery assay of which was $22.97.

CROWN POINT.—The 300 east stope is looking and yielding about the same as last week. A considerable amount of rock is still coming from the 300 west stope, and is composed chiefly of old fillings. Shipped to the mill during the week 774 tons 640 pounds of ore, the average battery assay of which was $16.

CHALLENGE CON.—A joint Challenge and Yellow Jacket west crosscut No. 1 from the north lateral drift on the 750 level was commenced and is now in 25 feet, the face showing porphyry. The joint Confidence, Challenge and Imperial west crosscut No. 2, on the 1000 level, is out 333 feet, having been advanced 25 feet during the week, the face showing quartz having no value. The joint Confidence, Challenge and Imperial north lateral drift, on the same level, is in 520 feet, 33 feet having been made, the face in porphyry.

CON. IMPERIAL.—Some necessary repairs have been made to west crosscut No. 3, 500 level, and also to the south lateral drift from top of the raise on the 450 level. The joint Confidence, Challenge and Imperial west crosscut No. 2, 1000 level, is out 333 feet, 25 feet having been made, the face in valueless quartz. The west crosscut No. 1, 1000 level, is out 263 feet, having been advanced 23 feet during the week, the face showing porphyry.

SAVAGE.—On the 300 level, at the end of the north drift, we started west crosscut No. 2, and advanced same 27 feet. On the 1300 level, in the north drift, the place we are cutting out over the winze for a hoisting engine shows a width of 18 feet of good ore. The east drift from the shaft is extended 123 feet. We are extracting ore from the 400, 500, 600, 750 and 1300 levels. During the week we hoisted 551 cars of ore, shipped to Rock Point mill 522½ tons, and milled 455 tons; average battery assay, $20.50. We have bullion on hand and at the mill amounting to $9059.

SEG. BELCHER AND MIDES.—The 1300 joint winze is down 67 feet, having been sunk 19 feet during the week. The bottom is in low-grade quartz and porphyry. The 850 south lateral drift advanced 23 feet since the last report, making its total length 98 feet. The face is in a mixture of clay, porphyry and streaks of quartz.

Eureka District.

ORE SHIPMENTS. — Eureka *Sentinel*, Aug. 9: During the week, the Eureka & Palisade R. R. Co. shipped 240 tons of ore to the Salt Lake smelters. The Lord Byron and Bullwhacker mines of the Ruby Dunderberg Co. are reported to be improving very rapidly and turning out considerable ore. Last Wednesday the Newark Mill Co. shipped by Wells, Fargo & Co. $4000 in silver bullion. The Richmond company is sinking a new shaft on the Williamsburg mine, and will remove the engine formerly used to raise the speiss to the furnace floors to the mine for use at the new shaft.

Hot Creek District.

AT RATTLESNAKE.—Eureka *Sentinel*, Aug. 9: We learn of some very cheering mining reports from Rattlesnake, Hot Creek district, Nye county. R. Gluyas of the New York Co. has a fine mine there, and is taking out a large amount of high-grade ore. Mrs. T. J. Williams also has a good mine, which she is having worked with good results.

Tuscarora District.

NEVADA QUEEN.—*Times-Review*, Aug. 9: Joint upraise from 600-foot level of North Belle Isle carried up 15 feet.

DEL MONTE.—The only work being done is on the second level in line crosscut, where the ore is being opened west and a raise put up east.

GRAND PRIZE.—The extraction of ore bas been temporarily suspended, owing to all the stamps of the concentrator being put on Commonwealth and North Commonwealth ore.

NORTH BELLE ISLE.—Work has been resumed in the old stopes from the 150-foot level. No. 3 upraise from the 600-foot level has been extended

o feet, showing some seams of spar and ore. No. upraise, same level, extended 11 feet. The pay treaks are not looking as well as at last report. oint upraise, same level, extended 15 feet, showing mass of spar and vein. Concentrator running as sual.

YOUNG AMERICA SOUTH.—Stopes producing as sual.

NAVAJO.—The stopes above the 150-foot level ontinue to produce high-grade ore.

BELLE ISLE.—Upraise from the 350-foot level has een extended 16 feet and connected with the 250-oot level. An intermediate crosscut has been run even feet from this raise, cutting a vein showing a ood width of ruby ore. Have resumed drifting outh on the rich ore, 350-foot level.

NORTH COMMONWEALTH.—First level—Stopes re being opened up and all look well. Third evel—Stopes continue about as last reported. Ten tamps of Union mill started on ore yesterday; no assays have been made as yet. Also putting hrough about 40 tons daily at the concentrator; verage assay, $21 per ton.

COMMONWEALTH.—Stopes all continue to yield bout the same grade and quantity as heretofore; 13 cars of ore hoisted, average battery pulp $238 per ton; average assay at the concentrator, $22 per on. Mill is running nicely and everything working veil. Will commence shipping bullion Monday.

ARIZONA.

PROSPECT.—*Silver Belt*, Aug. 4: A rumor of a ig silver strike near Quartzite gained currency this week. Upon inquiry we learned that a man by the name of Morgan, who has been prospecting in that vicinity, located a ledge on the right of the road eading to the Fame mine and about three-quarters of a mile this side of that property. The ledge has been opened for a few feet, and, we are informed, shows a pay streak of horn silver four to six inches n width. It is a good prospect, but more work will be required to determine its value. The Quartet Mining Co. of Globe, Arizona, has been organized for the purpose of mining, milling and developing mines. Milling will be done at the Nugget mill, near Richmond basin. Prospecting has been active n Globe mining district this season. More locations were made in the past six months than in the previous two years.

TODD BASIN.—Mohave *Miner*, Aug. 9: Messrs. Meyers & Pumher, who have a bond on the Mexican mine in Todd Basin, have made a rich strike even for Mohave county. Miners who have visited the mine say that there are two ore-hearing streaks n the ledge. The smallest one is 18 inches in width and assays 250 ounces per ton in gold, and is full of free gold. The largest ore-bearing streak is three feet wide and yields three ounces in gold and 80 ounces in silver per ton. They have the ledge stripped and have a showing of 100 tons of this kind of ore in sight. The boys can show the ore and invite any one who doubts the statement they make in regard to the Mexican mine to come and see it. It is the greatest showing of ore yet made in that section.

TONTO BASIN.—Cor. Prescott *Courier*, Aug. 4: The fact that mines can be developed and made to pay without the aid of much capital is being demonstrated here in Tonto Basin. Wm. Burch and four other men have pooled their mining interests. Their ledges are small, that is, from six inches to two feet in width, free gold, and will work from $15 to $20 per ton. While two of the men work on the mines, the other three are building a ditch from the East Verde, a water-wheel and arastras. They will have everything in running order in about a month, without any more care, worry or privation than the ordinary farmer experiences in planting his crop. The beauty of this thing is that it only has to be done once and the income begins right away, while the ranch man has to wait six months for his returns and repeat the operation yearly. The owners of the Grand Prize mine, on Weber Creek, have a complete mill outfit with steam-hoisting works and pump at the mine. A shaft down 160 feet, 250 feet of levels and an average of 18 inches of ore that will go $80 per ton, besides an air shaft 100 feet in depth in ore all the way, and two other shafts, one 50 feet and the other 20 feet in depth, also in ore that mills $20 per ton; there are five men interested in the mine, all workers. They go to work and take out a lot of ore; when they get enough for a run they start up the mill and the work they do is development work, getting enough ore in that way to pay them well. The result will be that in a few years they will have a well-developed mine, worth plenty of money.

BRITISH COLUMBIA.

FOUR CLAIMS SOLD.—Nelson *Miner*, Aug. 6: Last week a mining deal was made that will result in much good to the Kootenay Lake country—the Hot Springs camp in particular. It was a deal that means mine development for ore, and not for a speculative resale. The buyers—Mr. Boyle and Dr. Campbell—made the purchases for the syndicate who built and own the smelter at Revelstoke. The property purchased was the whole of the No. 1, the whole of the United, two-thirds of the Great Eastern and one-half of the Jesse R. Work will be commenced at once on the No. 1, under the superintendence of John Thompson. The first work will be to run an upraise from the tunnel to connect with the incline to drain the latter, it being full of water. It is said to be the purpose of the smelting company to take out 2000 tons of ore this fall for shipment to Revelstoke; but the shipment will depend on the early completion of the railroad from Nelson to Sproat. J. H. Hope, who has been doing assessment work on the Pacific, says that the claim is looking well and that some rich galena ore has been struck. The Baracoda and Birthday claims have been bonded to M. A. McDougal for $1000. They are located on 49 creek. E. Dempsie of Spokane Falls has put men to work on the Sunrise, a claim believed to be the first eastern extension of Hall's Kootenay Bonanza. At Hendryx's Blue Bell, work is still being prosecuted on the tunnel. Drifts are also being run and preparations made for taking out ore. At Wheeler's Krao the shaft is being enlarged for the steam hoist that will be put in as soon as the wagon-road, now building from Ainsworth, is completed. Messrs. Brickell & Herh of Spokane Falls have organized the Columhia Mining Co. to open up and work the Black Chief, Protection, Eden, Crescent, Coronation and Lakeview claims, all located in Hot Springs district. Mr. Herh is now on the ground. W. Sprague of Tacoma, who recently purchased an interest in the Daddy Gallagher—a claim at Hot Springs, adjacent to Wheeler's Gallagher group—has made a strike on it that promises well, the ore being of good quality. A Hot Springs claim that is attracting attention is Clark & Van Hook's Lady of the Lake. They have tapped the ledge by a tunnel, and the indications of a mine were so good that they will continue on work that will fully develop the property. The stoping of ore at the Skyline is being continued. Men are also engaged in grading a site for a working shaft. The point selected is about 200 feet west of the present incline shaft, and it is expected the ledge will be tapped at a depth of about 350 feet. The Skyline is one of the noted properties in the Hot Springs district.

WORK RECOMMENCED ON THE TOUGHNUT.—Development work, under the foremanship of A. Dodds, was begun this week on the Toughnut. For the present, the work will be confined to sinking the shaft, now down 37 feet and partly filled with surface water.

COLORADO.

THE FRANKLIN.—Aspen *Times*, Aug. 5: The work of repairing the Franklin for the resumptinn of active operations is nearing completion, the plant of machinery has been added to and improved, and when the mine starts up again it will be in shape to clear out the water quickly and to hold any future floods in check. Just when work will be resumed has not been learned, but it is understood it will be very soon. The mine has been closed down since the 9th of May, that being the date when the great flood burst into it.

SADDLE ROCK.—Developments in the Saddle Rock are highly satisfactory. The main drift now shows a two-foot streak of heavy lead ore, and this streak is gradually widening. The ore is low grade, carrying only 20 ounces per ton in silver, but it runs high in lead, averaging from 30 to 40 per cent.

IDAHO.

YREKA DISTRICT. — Wardner *News*, Aug. 2: Among the many good properties in the immediate vicinity of Wardner, the Old Abe lode on the head of Elk Creek has by late developments proved itself a honanza. During the last year a great deal of work has been done on the mine and it has been opened in such a manner that the owners are ready to take out ore and ship it, and so pay for the development work, which they contemplate doing immediately. Two parallel veins run through the property, both running high in silver and lying apart about 125 feet. On the upper vein, which was discovered two years ago, a shaft has been sunk to a depth of 40 feet, showing a well-defined vein from 20 inches to three feet wide, with a pay streak of from 8 to 14 inches of gray copper ore, assays running from 35 to 600 ounces silver to the ton. There is also a drift run to a distance of 68 feet on this vein. On the lower vein, which was discovered in the spring of 1885, a tunnel was projected on the claim adjoining the Old Abe. In it a large ledge of iron was encountered, but at that time the owners did not think it amounted to anything, and not till this spring did they discover that therein lies a veritable honanza. Last spring while running a tunnel to tap the upper vein, the lower vein was encountered at a distance of 190 feet from the mouth of the crosscut tunnel. The ledge here is from seven to eight feet wide, with a pay streak of gray copper ore from two to three feet in width, assays from which have ranged from 35 to 100 ounces silver per ton; the remaining portion of the ledge assaying from 10 to 15 ounces silver and from 3 to 10 per cent lead. These claims lie about one mile east of the Bunker Hill and Sullivan mines and are on the quartzite helt. The owners are Robert Horn, Charles Sinclair, Joseph Rogers, Fred Stevens, Thomas Hanley and J. T. Ingalls.

CUSTER.—The owners of the Custer have nearly completed excavating for the foundation of their 150-ton concentrator. This mill will be run hy water-power, a pressure of 300 feet having been obtained.

NEW MEXICO.

PROFITS.—*Southwest Sentinel*, Aug. 9: Frank Vingo received $1800 on Saturday, the profits of his last carload of Little Fanny mine ore shipped to Denver. The Flagler reduction works here are completed and will go into operation on Shakespeare ore to-morrow. Tbese will be run as custom works, with W. George Waring as manager. About 15 men will be employed.

GROWING RICHER. — The Good Luck mine at Camp Loomis grows more rich and hountiful in production as the miners work their way down. Regular shipments are going forward, yet quite an amount of ore lies sacked at the mine. From all that can be learned from miners and others who have visited the Good Luck, this paper is inclined to regard the property as among the richest and most productive in the precious metals of the honanzas of the West. Besides making a populous locality of Camp Loomis and enriching its locators and owners, Messrs. Brockman & Beall, the Good Luck will he the means of affording the Central, Lone Mountain and Camp Loomis district with a $20,000 stamp-mill to crush their ores, as already local capitalists are figuring on the project with every indication of arriving at a favorable result.

OREGON.

PLACER NOTES.—Jacksonville *Times*, Aug. 4: The Sterling Mining Co. is about ready to commence cleaning up, having had a good supply of water for several months past. Work is still being prosecuted hy the Jacksonville M. & M. Co. on its quartz ledge in Jackson Creek district. J. M. Mansfield, R. Moulton and Geo. R. Strickler are reported to have struck rich pay gravel on Jack's creek, a branch of Jump-off Joe. Eight ounces of dust in 15 days is the showing that Ab Giddings is reported to have made in his mine on Hungry creek a short time since. The season just ending has been a propitious one for most of the miners of Jackson and Josephine counties, who have generally made good cleanups. Jack Curtis is doing well at his claim on Beaver creek, having abundance of water and fine prospects. He made a showing of $22.50 in two and a half days' work recently. Adams & Wyant, who are working the placer mines east of Talent, unearthed what seems to he a superior cinnahar deposit. It is being thoroughly prospected at present. S. C. Stockton and Jas. Hopkins have struck the old channel gravel, rich in coarse gold, at the head of Wolf creek, after two seasons' search, and are correspondingly happy. Ennis & Cameron have finished cleaning out their Galice creek ditch, which was seriously damaged by last winter's storms, and will soon commence preparations for next season. Among Louse creek miners who have done well this seasnn are Messrs. Rowe, Beck, Pelton and Hull, who have taken $1200 out of the old Maury claim in two months' time. Messrs. Litton, Pankey, Barnett and Hallock have all done well.

FROM CRACKER CREEK.—Bedrock *Democrat*, Aug. 4: The *Democrat* reporter met yesterday, Dr. M. Ed. Werner, general manager of the Gold and Silver Extraction M. & M. Co. of Denver, Col., who is now on his way to Denver after a two weeks' stay at Cracker Creek, where he has been engaged with Dr. H. Leippman in making a test of the working of the ores of the Eureka and Excelsior mines. Dr. Werner, while not wishing to go into details at present regarding his operations, was plain and frank enough to tell the reporter that his process for working the ores of the E. & E. mines was a success and a short time longer would only be required to demonstrate the fact conclusively. He returns to Denver fully satisfied with the success attending his experiments and leaves his affairs here in the hands of Dr. Leippman, who will carry out his plans fully. On arriving at Denver Dr. Werner will purchase machinery required in the lixiviation process and forward the same to Cracker Creek at once.

UTAH.

THE HORN SILVER.—Salt Lake *Tribune*, Aug. 6: Hon. P. T. Farnsworth, manager of the Horn Silver mine, is in the city arranging for better facilities for shipping ore. He complains that since the fire at Milford the railroad company has not afforded them facilities for sending out ore. In June the mine shipped 2200 tons of ore, and during the preceding months this year the average was about 1600 tons per month. Not a ton has been shipped in July because of no facilities to do so. At the mine there are 1200 tons sampled ready to ship, and some 300 to 400 tons more ready for sampling, and the mine is in shape to send out from 1500 to 2000 tons per month. The question of concentrating this ore in three to one has been talked of, but if the railroad company will furnish ample facilities for shipping this may not be done for some time, but a concentrator is a thing of the future and may come soon, since in the mine there are many thousand tons of ore which must he concentrated to he of any use whatever. Work is being prosecuted on the 3d down to and including the 10th level. New ground has been opened on these levels extending 200 feet north of the old workings, with lots of ore on all these levels. The company has been annoyed much lately in not getting timbers for the mine as fast as they should. Three cars of timbers shipped from Oregon two months ago have not arrived yet, and these particular timbers are needed badly. A regular force of 100 to 110 men is employed in the Horn Silver mine.

BINGHAM.—Salt Lake *Journal*, Aug. 4: One of the biggest undertakings ever inaugurated in this district is the two-mile tunnel just begun by the Niagara Mine & Milling Co. The tunnel is being driven from a point some two miles above the railroad depot and right in the main canyon, to the Spanish and Miller group of mines, where it will tap three properties at a depth of some 1400 feet, and is expected to show up some of the richest ore to he found in Utah. In fact this region has already shown up mineral that discounts the Ontario away in the shade, running up into thousands of ounces to the ton of pure silver. Why this rich deposit should remain undeveloped is a question that can only he answered by saying, simply a lack of capital, or rather the lack of some one with sufficient hack-bone combined with capital to take hold and develop it as the Ontario has been of late. This is the matter in a nutshell. Bingham has always been considered a low-grade ore camp, and the reason of this was because the surface only was skimmed and nothing has been done to speak of in deep sinking, and there is where the best results always come from.

WASHINGTON.

LEDGES ON RUBY HILL.—Okanogan *Outlook*, Aug. 4: An *Outlook* reporter visited the base of mining operations in the Ruby district this week and was surprised at the rapid progress that is being made in the development of the principal mines on Ruby Hill. Work at present is confined principally to the Arlington, Fourth of July, Antler and First Thought, each of which is being subjected to a thorough and systematic course of development. The methods and machinery used are the best and most approved for the kind of work in which they are employed. At the present rapid rate of progress the developments of the next six months will practically determine the extent and value of the ore bodies of that district. If the result of the work thus far accomplished he taken as a criterion, the outlook is exceedingly hright.

EXCITEMENT AT PORT ANGELES.—Tacoma *Ledger*, Aug. 6: An excited movement, worse yet than the Oklahoma fever of a few weeks since, has struck Port Angeles. This time it is a gold-mining craze. For a long time it has been known that there are very rich deposits of gold and silver ore in the Olympic hills, immediately hack of the town, which have never heen developed. Of late uumerous placer finds have been made in the streams running down from the mountains through the town-site reserve, and experienced prospectors have pronounced it pay dirt. In view of this state of affairs, the arrival of a large mining party from Tacoma on Saturday, which proceeded to stake out and file on large tracts of the Government reserve under the general mining laws, very naturally precipitated a general stampede for mining claims. The land is being taken in mining districts of 20-acre tracts, eight persons clubbing together and taking a quarter-section. In some places a clash is imminent between the miners and farmer squatters, and in the meantime there is much interest and excitement as to the outcome. In many instances truly remarkable finds of color have been made, this fact being vouched for hy many of our best citizens.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUGUST 5, 1890.

433,609.—PILE COVERING—Almon Ames, Berkeley, Cal.

433,614.—DEVICE FOR DRAWING BEER—Frank Batter, Marshfield, Ogn.

433,558.—WRENCH—A. T. & A. W. Brann, Dayton, Nev.

433,849.—OIL-CUP—C. L. Burbeck, Ft. Bragg, Cal.

433,670.—ORE-MILL — Carl & Paterson, San Diego, Cal.

433,672.—SASH HOLDER—A. T. Church, East Oakland, Cal.

433,617.—GARMENT SUPPORTER — Gertie D. Cluff, Lodi, Cal.

433,618.—STENCIL AND STENCIL PLATE—G. H. Cunningham, S. F.

433,452.—COVER-HOLDER FOR DINNER-PAILS—John Dorsch, Tacoma, Wash

433,892.—SAFETY GUARD FOR RAILWAYS—H. Ewing, S. F.

433,787.—SLATE SPONGE—Emma C. Hudson, Seattle, Wash.

433,596.—SASH BALANCE—Axel Johnson, Oakland, Cal.

433,600.—SASH-FASTENER — Benj. Marshall, S. F.

433,484.—HAY PRESS—S. H. & C. L. Miller, Stockton, Cal.

433,540.—STREET PAVEMENT—G. W. Parker, S. F.

433,601.—TRAVELING BLOCK — A. Rewrick, S. F.

433,545.—SMOOTHING-IRON—Silberstein & Amos, Los Angeles, Cal.

433,913.—TOOL FOR INSERTING SAW TEETH—R. P. Smith, Marshfield, Ogn.

433,753.—WAGON BRAKE—R. P. Taylor, Gold Hill, Nev.

433,555.—HORSE CONTROLLING DEVICE—Clara Turney, Sausalito, Cal.

433,608.—GANG-PLOW HARROW—W. A. Zumwalt, Farmington, Cal.

The following brief list by telegraph for Aug. 12 will appear more complete on receipt of mail advices:

California—Ciser Bazus, S F., mat for fermentiug vats; Jerome B. Harris, assignor of one-half to J. Gambetti, Stockton, traction machine; William P. Humpbreys, assignor by mesne assignments to A. M Stinson, S. F., joint connection for suction pipes and protectors of dredgers; Charles A. Hussey, Fort Bidwell, cartridge shell reloader; John Isele, San Diego, spring motor; Angus E. McMillan, Oakland, miter box; Edward E. Park, S. F., rotary blotter.

Oregon — Charles Hill, Portland, clothes-book; William A. Miller, Wapintia, crosscut saw; Martin L. Pipes and E. F. Pernot, Corvallis, copy-holder for type-writing machines; Junius F. Whiting, Albany, means for reaper and mower knives.

Arizona—Dudley I. Craig, Silver King, adding machine.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SASH BALANCE.—Axel Johuson, Oakland, assignor to the Marshall Improved Window-Furniture Co. of S. F. No. 433,596. Dated Aug. 5, 1890. This invention relates to sash balances and that class of springs therein used known as spiral, and it consists in a spiral spring returned upon itself so as to form independent layers the one within the other. The general object of the invention is to provide for the maximum strength or tension with the minimum length of spring and to better equalize the power of the spring. The spring is especially intended to be applied to the form of sash balance patented by Benjamin Marshall, Jan. 23, 1890.

TRAVELING BLOCK.—Assaria Rewrick, S. F. No. 433,601. Dated Aug. 5, 1890. This invention relates to that class of traveling blocks for the main sheet of vessels, and it consists in the novel construction and arrangement of the block. The object of the invention is to provide a simple and effective device of this character which will readily move from side to side, and is so constructed that it will permit the sheet to pass over from one position or direction to the other without interference.

PILE COVERING.—Almon Ames, Berkeley, assignor to Robt. J. Davis of S. F. No. 433,609. Dated Aug. 5, 1890. This patent covers certain improvements for protecting piles against the ravages of marine insects and worms. The pile covering consists of sheets of metal wrapped around the pile and having their meeting edges united so as to form a single longitudinal joint, with bands or rings which fit over the adjacent meeting ends of said sections and joints.

DRAWING BEER.—Frank Batter, Marshfield, Oregon, assignor of one-half to Lars Clemmensen. No. 433,614. Dated Aug. 5, 1890. In drawing beer or other liquids from casks in which it is contained under considerable pressure, it is necessary to draw the beer very slowly to prevent too great a quantity of foam, and in order to overcome this objection, the gas is frequently partly discharged from the cask so that when the beer has nearly been all drawn it becomes flat. This invention consists of an attachment to an ordinary beer-faucet whereby the beer can be drawn with greater rapidity without the necessity of reducing the gas pressure within the cask,

MECHANICAL PROGRESS

Alloys of Steel and Nickel — Mitis Metal.

The ever-increasing demand of the world at large for greater rapidity of locomotion on land aod sea, greater economy of fuel and great motive power in small hulk, has created the necessity for the production of improved materials of constrnction which engineers can nse with confidence and snccess. Much sustained effort has accordingly heen devoted hy onr metal manufactnrers and metallurgists to the examination of the properties of new metals—new, we mean, from a commercial standpoint—and aleo new alloys or old alloys stndied under improved conditions. The many new materials now available for engineering purposes are the results of this work, and it is interesting to note how varied are the properties and capahilities of the newer commeroial alloys.

Mr. Nordenfelt's so-called "mitis" metal is intended to meet the demand for wrought-iron castings, or rather castings which have the properties of wrought-iron and yet the free fluidity of cast iron, and it consists of an alloy of iron and alominium which has most remarkahle properties. It· oasts readily, produces sonud castings, which are soft and malleahle, and have great tensile strength, without requiring to undergo the tedions process common to ordinary malleahle iron castings. Mr. Hadfield's manganese steel also possesses remarkahle properties, and alloys of steel with chromium, copper and other snbstances are now, perhaps, not in common nse, hut still they are largely used for various purposes. Aluminium itself, although mostly used as an alloy with copper, yet hids fair, if Sir Henry Roscoe is correct, to come into use as a constructive engineering material. At present its cost forhids this, hut no douht, if the manufacturing difficulty could he overcome, the valuahle properties of this metal would he gladly utilized hy engineers. According to Sir Henry Roscoe, its hreaking strain varies from 12 to 14 tons per square inch, and its specifio gravity cast ie 2 58, and rolled and hammered 2.68—that is, an equal hnlk of iron is rather more than 2½ times as heavy.

This considerahle tensile strength, taken in conjanction with its power of resisting corrosion from air or water, would make its use widely extended if it could he sold at a reasonahle price. However, if we may judge from a paper read hefore the Iron and Steel Institnte, just published in their journal, steei and its modiiications have not hy any means attained their foll and complete development. Mr. James Riley, whose nsme is so well known as an authority on all matters pertaining to steel manufacture, and who has had so large a share in the introduction of mild steei for construction and engineering pnrposes generally, has made a considerahle number of experiments upon the influence of nickel upon the properties of steel. These experiments he descrihes in his interesting paper. Taking a sample of mild steel for example, containing ahout 0 22 per cent of carhon, when annealed the elastic limit would he reached with a tensile strain of 16 tons per square inch, and the hreaking strain wonld he 30 tons per sqnare inch. The extension of a test piece of eight inches in length would he ahout 23 per cent, and the contraction of area ahont 40 per oent. Now, the same composition of steel, to which has heen added nickel to he present to the extent of ahout 4.7 per ceot, at once gives a material standing a strain of 28 tons per square inch hefore reaching the elastic limit, and having, moreover, a hreaking strain of 40 6 tons per square inch withoot impairing the elongation or contraction of area of the specimen to any marked extent. The elongation of an 8-inch test piece is 20 per cent, and the contraction of area ahout 44 8 per cent after rolling and annealing, as with the mild steel sample. With three per cent of nickel and 0 35 per cent of carhon, the elastic limit is the same, 28 tons per eqnare inch, hut the hreaking etrain ie increased to 48.5 tons per square inch. At the same time the extensihility and contraction of area are somewhat reduced.

Steels containing nickel up to five per cent can he machined with moderate ease; heyond that, they are more difficult to machine and the alloys poorer in nickel stand punching remarkahly well.—*Western Machinist.*

AN ELECTRICAL ENGRAVING MACHINE.—Among the electrical inventions recently patented is an engraving machine which is electrically controlled and operated. This little machine appears somethiog like a planer, and like that machine, has a sliding-hed on which the work is placed directly nnder the engraving tool, which is held in a crane neck. The hed has a reciprocal motion under the engraving tool, and is operated hy a level, which, in reciprocating the hed for the work, also reciprocates a carrier upon which the copy is placed. Suspended over the carrier is a very delicate tracing point; this acts as a contact, and is insulated from the supportioo mechanism; the carriage reciprocating moves under this tracing point, which tooches the prejsoting surfaces of the metallic oopy, which makes and hreaks the circuit; at the same time the tracing point is antomatically moved hack at right angles to the direotion in which the copy carriage moves, so that with each reciprooation of the carriage, the oontact point moves over a different part of the original copy. The engraving tool is carried in a frame whloh moves back at right angles to the direction the hed moves in, keeping pace with the rear work movement of the tracing point, and as the circuit is opened and closed hy the action of the tracing-needle, the tool is controlled hy the action of a magnet in the oircuit. This machine, hy suitahle attaohments, will engrave equally as well on a concave or convex snrface as on a level surface, and in the latter may he in a straight line, in a oirole or in irregular curves. To show the valne of this machine, we will suppose that a silver tea service is purchased as a wedding present, and the purchaser reqnests that a monogram be engraved on each article—the engraver can sit down and on one piece engrave the desired monogram, plaoing this copy under the tracing-needle, and starting the machine he may reproduce the monogram exactly like the orighal on each of the articles, no matter if there he a hundred.—*Electrical Review.*

THE MANNESMANN PROCESS.—One of the strangest and at the same time important improvements of onr time is reported from Germany for producing metal tnhes from solids hy the action of "skew rolls." We have already noticed this invention at considerahle length, and again refer to it to state that there are now founded in Germany five factories for this proocss, from which we may infer it has passed heyond the experimental stage. Not only are pipes made in this way, hut also gun-harrels and hollow shafts and axles. Recently a steel tuhe of three-inch hore, one-fourth inch thick and 70 feet long was made, and the molecular condition of the metal is such that its tensile strength is increased hy the process. The following quotation from a foreign journal will serve to give some idea of the process: "Tne har, in its passage through the rolls, is twisted as a thread is twisted in a spinning machine. As, however, it cannot he fed from the ontside as is the thread, and as has heen said, the diameter cannot he reduced on account of the sotion of the rolls, it is forced to draw on the interior for a supply of material." The invention was many years heing developed, and is called the "Mannesmann Process," from the name of the inventor.

CAN IRON BE TEMPERED?—It has heen the general opinion always, we helieve, among hlacksmiths, that iron could not he tempered. Mr. E. K. Wehry of Lost Nation, Iowa, claims that it can he tempered, and he has sent us a piece of a horseshoe which goes to prove the trnth of his assertion. He says in a letter to us on the snbject: "You will see that I claim iron can he tempered or hardened so that a new file oannot touch it. To prove what I claim, I send yon hy to-day's mail a sample of a heel of an old horseshoe tempered in the same manner that I temper all the new shoes that I set. You will see that at last a way has heen discovered to harden iron soccessfnlly. Although thousands of hlacksmiths will tell yon that it cannot he tempered or hardened, I am willing to put up $50 that I oan temper any kind of iron with fire and water alone, no drugs of any kind to he used." This opens up a very interesting question for the consideration of our readers, and we should like to have a general expression of opioion from them on the novel snbject of tempering iron.—*Western Machinist.*

A RECENT MECHANICAL NOVELTY consists of a combination mold and ladle for casting soft metal hammers, thus insuring a snpply constantly at a small outlay, the device in qoestion enahling the old heads, with the addition of a little extra metal, to he remelted, and shapely, serviceable hammers to take the place of the old and hattered ones; nor can the heads of these hammers he jarred off, as the metal closely surronnds the tree-shaped core of the handle, which may be made of common iron pipe, or a rod with pin through the end. The operation is to place the handle in the mold, fasten with the two ringe, melt the metal sufficiently to flow, and then hy depressing the handle allow the metal to flow into the mold. The ladle heing connected and opening directly into the mold, hnt very little heat is required to cast the hammere—that is, just enough to make the metal run. Ordinarily, to secure a good casting, molde require to he heated, hut with this arrangement it is simply necessary to heat the mold simultaneonsly with the melting of the metal.

HANDWRITING ON IRON CASTINGS.—This is accomplished hy the nse of an ink which leaves a snhstantial and hard hody—one that will not he destroyed hy molten iron. The discovery was made hy a Boston man. The writing is done upon ordinary paper and hackward, from right to left instead of from left to right. The paper is then placed in the mold and the melted iron poored over it. The paper is hurned away, hut the ink resists the action of the molten iron and leaves an indented impression upon it.

THE CLOTHES WRINGER FOR THE LETTER PRESS.—They use a clothes wringer for a letter press in one of the largest of the Wall street telegraph offices in New York. The messages to he copied are treated as nsnal until the time for the putting of them into the press; then, instead of the ordinary screw press, whioh it takes time and muscle to use, the message and damp tissne paper are simply run through a clothes wringer.

SCIENTIFIC PROGRESS.

A Liquid Volatile Nickel Compound.

Nickel seems destined to startle the modern chemical world. From being a comparative rarity, except on plated goods, it hcame a common laboratory material hnt a little while ago; then its title to he considered an element was impngned, and now it is hoth triumphantly reinstated and its vapor density, for the first time, determined. These results have followed from the researohes of Mr. Mond and Drs. Qainoke and Langer, which were recently made the subject of a paper read hefore the London Chemical Society. The investigation owed its origin to the need for removing carhonic oxide from producer gas, in order to nse it in the gas hattery described in Mr. Mond's presidential address at the annual meeting of the Society of Chemical Industry last year—nickel aod cohalt heing found to effect this object.

Working in this direction, it has been fonnd that a direct compound of nickel and carhonic oxide, viz., $N(CO)_4$, exists, the new snbstance heing a *colorless liquid*, volatile at ordinary temperatures, hoiling at 43° C., having a specific gravity of 1.3185 at 17° C., soluble in alcohol, henzine and chloroform, and not acted upon hy dilnte acids and alkalies. Its vapor explodes when heated to 60° C. Its vapor density, determined hy Victor Meyer's method, is 6.01, instead of the theoretical value, 5.9; from this, the atomic weight of nickel is fonnd to he 58. The metal itself can he ohtained from it in the form of hrilliant metallic mirrors of such purity as to form a splendid raw material for the redetermination of the atomic weight. The mean valne ohtained hy reducing nickel oxide from this source hy heating in a stream of electrolytic hydrogen was 58 61, correspondieg closely with that previously accepted, viz., 58 52. This proves conclusively that Kruss and Schmidt's assertion that the metal hitherto oonsidered to he pnre nickel is oontaminated with another element, and that all data concerning it conseqoently need revision, cannot he sustained, and replaces nickel as we have always known it among the elements.

The constitntion of the compound $N(CO)_4$ is still the snbject of the keenest speculation. Mr. Mond declined to he "drawn" on this point, admitting the temptation to represent it hy some fascinating ring formula, hut contenting himself at present with a statement of the facts. In connection with this curious hody it is to he noted that no similar cohalt oompound can he ohtained, thus establishing another method of differentiation and separation hetween it and its twin hrother nickel.—*Ex.*

Food Artificially Produced.

No hranch of science presents a wider field for discovery or specnlation than chemistry, especially in that hranch which treats of organic compounds. The discovery of means wherehy many organic snhstances have already heen produced artificially from inorganic sources, has given encouragement to the hope that this mode of prodnction may in the near futnre he made to solve the problem of a futnre inexhanstihle source of hnman sustenance when there shall not he fields enough on the earth to provide its inhahitants with the ordinary food with which they now sustain life.

A German scientist of no less eminent anthority than Victor Meyer has recently made a pnhlic address in which he announced that "we may reasonahly hope that chemistry will teach ns to make the fiher of wood a sonrce of human food."

In allnsion to this expression, *Kuhlow* remarks as follows: "What an enormous stock of food, then, will he fonnd, if this hecomes possihle, in the wood of our forests, or even in grass or straw. The fiher of wood consists essentially of cellnlin. Can this he made to change into starch? Starch has exactly the same percentage in composition, hut, as every one knows, it differs very much in its properties, and the nature of its molecule is prohahly much more complex. Cellulin is of little or no dietetic valne, and it is not altered, like starch, in hoiling water. It readily gives glncose when treated with snlphuric acid, as is easily shown when cotton wool, which is practically poor cellulin, is merely immersed in it. Starch gives the same prodnct when hoiled with weak acid."

To the ahove may he added a quotation from the researches of Hellreigel, which go to show heyond dispute that certain plants transform atmospheric nitrogen into alhomen, and that this process can he improved hy suitable treatment. The prodnction, therefore, of starch from cellulin, together with the enforced increase of alhumen in plants, would, he adds, in reality signify the abolition of the hread question.

It must he horne in mind, however, that theory, fascinating and promising though it may he, is not always capahle of heing followed up hy a practical result.

WHEN WINTER WILL BE SUMMER.—The plane of the earth's orhit crosses the equator at an angle of 23½ degrees, hut it is held that through the attractive force of the sun and moon, or from some other and nnknown canse, the pole is heing oonstantly tilted away from the sun, while the equator is as constantly being drawn toward it. As a consequence, the sun crosses the equator each year a little farther west than the point at which it crossed the last previous year. It is generally helieved that at a remote period of time, say some 20,000 years ago, the place of crossing preceded or went forward to meet the sun, in whioh oase we shonld nse the phrase "precession of the equinoxes," instead of "recession of the equinoxes" as now. This "recession" is ahont 50 seconds of a degree each year, and in consequenoe thereof the time will come, perhaps in some 20,000 years from now, that the sun will cross the equator on the 21st of January instead of the 21st of June as now. When that time arrives the time of the seasons in the calendar will he reversed from what they now are and the Fourth of July will he celehrated in midwinter instead of midsummer.

THE DISTINCTION BETWEEN LABOR AND WORK. Dr. Edward Everett Hale well expresses a fine thought in wishing to revive the old distinction made in the nse of the words lahor and work. Labor refers to toil with the hody or hands. Work implies the skill wherehy mind enahles the hand to do much more than it otherwise wonld. Thns it is said of those who have lived wisely that "they rest from their lahors and their works do follow them." Dr. Hale says God works, hut He does not lahor. The effect of all modern civilization is to make steam and other natnral powers do the "lahor" while man does the "work." This is a distinction less known in Enrope, where a much larger proportion of lahor is nnskilled than it is here. In Massachnsetts it is fonnd that 89 per cent of workers are skilled laborers, while only 11 per cent are nnskilled. Probably the real proportion of unskilled lahor is less than this. In farming, for example, the necessity of skill to effective work is recognized hy all who are acqnainted with this husiness. Yet in the statistics of a census-taker, many skilled farm-workers wonld be set down as unskilled. This prejudice is a serious injnry to the farmer's husiness. The idea that hrain is less needful here than elsewhere, and that physical hrawn is everything, ought to he got rid of. It is injurious and hesides it is not trne.

THE OCEAN UNDERTOW.—The pnhlio has recently heen treated to several sensational articles on "hair-hreadth" escapes from hreakers at pnhlic hathing-places. The dreadful nndertow, which makes such places so dangerous, is very clearly and simply described hy Daffield Oshorne: As each wave rolls in and hreaks upon the heach, its volume of water flows hack again, and as the sncceeding wave hresks over it, it naturally forms an undercnrrent flowing outward, of strength proportionate to the hody of water it contains, and also proportionate in a great measure to the depth of the interval hetween the waves. Where this latter is considerahle, it is ohvious that the water of receding waves will flow with similar effect to that of water going over a fall, and that a person standieg near is likely to he drawn over with it, and thus, if the interval is deep enough, oarried out of his depth.

DEATH FROM ELECTRICITY.—The execution of Kemmler hy electricity has drawn out much discussion and speculation in regard to the precise action of electricity in destroying animal life. A prominent electrician says that just what takes place in the human organism to produce death from an electric current seems to he an nnsolved problem. One of the theories sometimes advanced concerning it is that when a heing suffers death from electric shock, it is a pore oase of internal rupture or explosion from the generation of gas or vapor. In snpport of this view, the way in which telegraph poles are sometimes torn to pieces is referred to. The lightning followe the moist portion of the pole, which is the core or heart; in this oase the moisture is vaporized and an explosion occurs. The high resistance produces heat, the heat in turn steam, and the steam explosion.

ICEBERGS ON THE ATLANTIC are reported to present a much higher altitude than usual the present season. Some have been reported fully 700 feet high. Their mase must have heen in proportion—only one-ninth of it would appear above water. It is thonght that many icehergs in arctic seas, that have remained immovable for ages, have broken loose this season, an event which may forehode great and possihly permanent improvement in Northern temperatures, which may he a heginning of changes in climate that will possihly render the northern portion of this continent more fitted for human hahitation than it has been in the recent past.

A BASIS FOR DURABLE LABEL INK.—It has long heen known that a solntion of hichlorate of eodium, or horax, possesses the property of dissolving or softening various resins which are unaffected hy plain water and hy the great majority of saline solutions. As a hasis for a permanent lahel ink, unaffected hy water or moderately strong acids, there is nothing equal to a half-satnrated solntion of ordinary horax, duly charged with as much orange shellac as it will take np on hoiling for 20 minntes.

A FIRE DAMP INDICATOR.—A small instrument has heen devised for use in mines to indicate the presence of fire-damp, or in gas mains to indicate the presence of gas. The invention is hased upon the property certain metals have of evolving heat in the presence of hydrogen gas.

GOOD HEALTH.

Influenza and Faith Cure.

The impression seems to be gaining ground that faith cure and mind cure and all the cognate cures are much more effective when there is nothing the matter with one than when the body is really ill or diseased. An illustration of this recently occurred in Jersey City, where a well-known citizen had been an ardent believer in and advocate of the faith cure. He had gone so far as to build a chapel and dedicate it to the cause, and had impressed the wonders of faith cure upon his family; but one day the influenza came along, and as it entered the door the faith cure flew out of the window. The "grippe" was too much for faith, and the doctors had to be summoned.

No one will attempt to deny the influence of the mind over the body in many cases, nor the reflex influence of faith or prayer or any other outward demonstration. There are certain maladies of the body which may be reached more readily and effectually through the mind than in any other way, but from this it does not follow that all diseases are curable in this way. The cardinal mistake of the Christian Scientists and of the believers in faith cure and mind cure is in denying the existence of things which are palpable to the senses; of confounding the phenomena of consciousness with those of volition, and of insisting that all afflictions of every kind are subject to the control of the mind or will.

Modern science is sufficiently eclectic to recognize the great value of mind cure or faith cure in its proper sphere, but the pseudo-science which asserts the power of performing miracles is so narrow and bigoted as to deny the therapeutic qualities of any and every kind of medicine, though demonstrated by years and even centuries of experience. When the time comes for the crucial test, however, those who are not fanatic on the subject will yield their opinion to the skill of others, and if they do not they show themselves devoid of reason and common sense.—*Ex.*

The Gila Monster.

One of these dangerous, lizard-like reptiles was exhibited alive at a meeting of the Academy of Sciences a few weeks since and attracted considerable attention. This reptile is no doubt of a very dangerous character, especially when angered. An Arizona ranchman, by the name of Vail, was recently riding in the neighborhood of his home, when he espied one of these reptiles in the road, and alighting from his horse, killed it as he supposed. He tied the carcass to the back of his saddle and resumed his journey, but soon had occasion to place his hand in the vicinity of the animal, which instantly seized one of his fingers with such a vise-like grip that it could only be removed by having its head literally cut to pieces, which was done by an Indian who accompanied him. The gentleman himself immediately cut the flesh of the finger to the bone, just above the wound, and tied a string tightly around above the cut. He then rode for life to the nearest railroad station, 25 miles distant, where he procured a locomotive and rode 40 miles farther before he was able to secure medical aid. By that time nearly the whole of his body had turned black, and the physician gave him no hope of being able to restore him, although he did congratulate him upon his good sense in refusing to drink whisky at the start as the Indian advised him to do—for that, he said, would have ended his life very speedily. Hard work and the application of the best remedies, at last brought the patient around, however, and he is probably the only man living who is able to relate his own experiences in being saved from the usually fatal bite of a Gila monster.

A REMEDY FOR BURNS.—"A celebrated German remedy for burns," according to the Detroit *Free Press*, "consists of 15 ounces of the best white glue broken into small pieces into two pints of water and allowed to become soft; then dissolve it by means of a water bath and add two ounces of glycerine and six drachms of carbolic acid; continue to heat until thoroughly dissolved. On cooling, this hardens to an elastic mass, covered with a shining, parchment-like skin, and may be kept for any length of time. When required for use, it is placed for a few minutes in a water bath until sufficiently liquid, and applied by means of a broad brush. It forms, it is said, in about two minutes a shining, smooth, flexible and nearly transparent skin."

THEIR WEAKNESS.—The superstition about woman's relative weakness begins to show itself in the training of children. Girls are ludicrously guarded against exercise that they need as greatly as boys, and at every critical period of their life thereafter they pay in suffering for the misguided consideration of those who had their training in hand. The so-called "lady-like" demeanor of girls is a thing to excite impatience. Girls brought up in strait jackets of physical propriety—physical freedom will hurt nobody's "manners"—can never have the grace of deportment, the variety of poise, the readiness in emergency that will belong to girls of liberal physical training.—*Checkley's Method of Physical Training.*

TO REMOVE THIRST.—Paint the tongue of your fever patients with glycerine, says a physician; it will remove the sensation of thirst and discomfort felt when the organ is dry and foul.

IT IS STATED that a system of electric homeopathy has been used with some success in India to cure leprosy.

USEFUL INFORMATION.

WEBSTER'S IDEA OF THE PACIFIC COAST.—It is somewhat singular that a man like Daniel Webster should have entertained such an erroneous idea of the value of the Pacific Coast as his own words show that he did. Less than 50 years ago a bill was brought before the United States Senate to establish a mail route from Western Missouri to the mouth of the Columbia river. Senator Webster opposed the measure as a useless expense and spoke as follows: "What do we want with the vast, worthless area—this region of savages and wild beasts, of deserts, of shifting sands and whirlwinds of dust, of cactus and prairie dog? To what use could we ever hope to put these deserts, or these endless mountain chains, impenetrable and covered to their base with eternal snow? What can we ever hope to do with the western coast—a coast 3000 miles long, rock-bound, cheerless and uninviting and not a harbor on it? What use have we for such a country? Mr. President, I will never vote a cent from the public treasury to place the Pacific Coast one inch nearer to Boston than it now is." After reading the above no one need be surprised that he made the great mistake, in his Webster-Ashburton treaty, of giving away our acknowledged claim to the Pacific Coast from the present northern limit of Washington to the southern boundary of Alaska, while all the country was crying out, "Fifty-four forty or fight!"

THE ELECTRIC LIGHT AS AN INSECTICIDE.—But few are aware of the enormous destruction of insects effected by the electric light. A German entomologist has been investigating and reports that he has found as many as 33,000 are destroyed in one night by a single globe light. Insects must be more plentiful in Germany than here to furnish such an item. But there is no question but that the electric light might be made of great use in destroying many noxious insects which infest our gardens and fields. Mosquitoes, however, and grapevine pests and the pestiferous potato-bug seem to be too wise to be thus ensnared. The chief species which succumb to the wiles of the electric light are gnats and midges.

HANDLING SPARS HERE AND THERE.—The bark William W. Crapo recently arrived at Boston from Washington with a cargo of spars and shingles. Her arrival at Boston created a decided sensation, particularly among the stevedores, when upon examination it was found that her cargo of spars was ugly material for them to handle. Some of the spars were over 120 feet long and 42 inches square, each valued at $300. Capt. Hardy thought he would have to take some of the heavier spars back to Washington, but finally some stevedores were found who managed, in two days, to take out a spar that had been placed in position on the vessel in Washington in as many hours.

RECENT PATENTS.—Among recent patents may be mentioned a knife for separating the loin from the back of pork, an operation which is effected by its means with great celerity; a hand-rest for penmen, consisting of a wire cushion in the form of a coil, which is attached to the wrist, and lessens the wear and tear involved in the act of writing; a skirt elevator, by which "a ladies' skirt may be raised effectively and elegantly with ease and certainty;" and a music rest, by which the music is brought up to a level of the face of a singer, and all undue pressure on the throat from leaning over is avoided.

TO GET RID OF ANTS.—A correspondent of the *Scientific American* says: Buy one-half pound or more corrosive sublimate, powder it very fine and strew the same sparingly on the ground, also in the crevices, nests and trails of the ants, and I guarantee they will leave your premises as quick as they have come. Corrosive sublimate is a deadly poison and should be handled with care.

A CALIFORNIA ROSE BUSH.—The trunk of a rose bush growing in Ventura, Cal., is said to be three feet in circumference, and the first branch it throws out is 21 inches in circumference. It runs over a lattice-work, and, though more than a wagon load of boughs have been removed, it covers about 1200 square feet.

A LARGE BUILDING STONE.—The largest and heaviest building stone ever quarried in England was taken from the Plankington quarry, near Norwich, in February, 1889. It was in one piece, without crack or flaw, and weighed over 35 tons. It was 15 feet long, 6 feet high and 5 feet wide.

ELECTRIC LIGHTS AT THE CAPITAL.—Plans are being perfected to light up the federal buildings at Washington with electricity. It is found to be much cheaper than the present system of gas lighting.

THE REASON WHY firecrackers are always covered with red paper is that red is the festive color in China, and that firecrackers are used chiefly on festive occasions.

THE BUILDER.

Tips for Builders.

Old flooring can seldom be utilized, though I have seen it used for temporary purposes, such as fencing, covering of veranda floors while finishing work on plastering, etc. As a rule, however, it does not pay to take it up carefully and preserve it. Conductor pipes, metallic cornices and sheet-metal work generally can seldom be made available a second time, though all is worth caring for, as some parties may use it for repairs.

Sinks, wash-basins, bath-tubs, traps, heating appliances, grates, mantels and hearthstones should be moved with care. They are always worth money, and may be used in many places as substitutes for more inferior fixings.

Marble mantels require the most careful handling.

Perhaps the most difficult fixings about a house to adapt a second time are the stairs. Yet I have known where a man has so managed to put up new buildings that the old stairs taken from another building just suited. This may have been a "favorable accident," but the initiated reader will understand him. Seldom such accidents can occur.

Rails, balusters and newels may be utilized much easier than stairs, as the rails may be lengthened or shortened to suit variable conditions.

Gas fixtures should be cared for and stowed away in some dry place. They can often be made available, and are not easily renovated if soiled or tarnished.

Never send old material to a mill to be sawed or planed; no matter how carefully nails, pebbles and sand have been hunted for, the saw or planer knives will most assuredly find some you overlooked; then there will be trouble at the mill.

Have some mercy for the workman's tools. If it can be avoided, do not work up old stuff into fine work. If not avoidable, pay the workman something extra because of injury to tools.

Don't grumble if you do not get as good results from the use of old material as from new. The workman has much to contend with while working up old nail-speckled, sand-covered material.—*American Builder.*

BRICK VS. FRAME DWELLINGS.—Nothing, says the *Clay Worker*, is more to be deplored than the relative increase of the number of frame dwellings in our large cities. There are acres of kindling-wood construction, comprising the woof and web of all but the centers of our large cities. Through the improvement in the quality of clay products, and the constantly increasing cost of wood as a building material, together with other natural and well-known advantages leading to the use of brick, it is to be expected that there will be a revulsion of feeling favorable to brick houses within the near future. A frame dwelling is necessarily a temporary structure. The decorative features are marks for decay and degeneration. The more ornate a frame house is made, the more temporary is its character. The waste of money in these insecure temporary structures is frightful to contemplate. If for no other reason, people should build of the more substantial material because of the danger from fire. We have startling examples of this every day in the loss of life and property. Yet the spirit of shoddyism, sham and show is a part of so many of our home-seekers that the increase of these inflammable piles is yet apparent. The reduction in the cost of money, in the rate of interest, should in itself suggest better houses, better dwellings of brick. The cost of building a brick house is less than it was a few years ago, when all decorative work had to be done in stone at a great expense. Now the ornamental effects in a brick house are secured at a much less expense through the terra cotta and ornamental brick which can be produced more economically than stone and are more durable and beautiful as well.

LEGAL ASPECTS OF PHOTOGRAPHING BUILDINGS.—An excellent idea is suggested by an architect who writes to the Pittsburg *Real Estate Record* as to the benefit of photography in building operations. He remarks: "With high buildings arises a question of good foundations, especially when they are built alongside of old buildings two or three stories high. The greater weight of the new and high building is apt to crack the old building and damage it, and great care should be used in building up to prevent the settling of the new building from injuring the adjoining property. I suppose that for any damage done to the adjoining building the proprietors of the new building will be responsible, so I would recommend not only care in the foundation of the new building, but that the adjoining buildings be photographed to a large scale before any work is done on the new building, so that their condition might be on record in the event of a claim for damages. These photographs should be taken under the charge of one well acquainted with building, and should be not only the back and front, but the sides and parts of the buildings adjoining the new one. Often there are cracks in those side walls and they ought to be photographed. One may laugh at the idea of photographing a crack, but it is sometimes very necessary, and I have seen the owner, who was claiming that the new building had damaged his property, look very queer when a photo of that same crack was shown, proving that it was there before the new building was erected."

ELECTRICITY.

Electric Railways.

We clip the following from the editorial columns of London *Iron*. Though probably collated from American journals, the editor of *Iron* gives it his editorial sanction:

There is every probability that electrical railways will be the railways of the future, and a little thought will fully demonstrate this. According to Captain Eugene Griffin, who recently lectured on the subject at the Franklin Institute, Philadelphia, the success of electrical propulsion has been established beyond a question. It is only a matter of time, and that a short time, when it will replace the horses on the majority of street railways. It is only a matter of time, a somewhat longer time, perhaps, when it will be the propelling power on all elevated roads, for elevated railways possess ideal conditions for the application of electricity. It is within the bounds of possibility that steam roads will be worked by electricity; certainly this power offers many advantages for the suburban traffic in the vicinity of large cities. The possible utilization of hitherto neglected water-powers will be one of the features in determining the extension of electrical propulsion in this direction. Already we see the beginning. Longer trains are requisite to meet the increasing demands. The limit of the capacity of the present locomotives has been reached. Increased weight in the locomotive means an immense expenditure for strengthening or practically rebuilding the roadway. Cables are not feasible, as the strain on the grip would not permit of long trains, and it would be difficult to combine speed and safety with any considerable increase in the number of trains. Cables would not permit of satisfactory switching arrangements at the termini and elsewhere. Electricity offers the best solution. Equip each car with motors. Flexible electrical connections can easily be made from car to car, as is now done on surface roads, to light the tow cars, and the whole train controlled by the driver on the front platform of the leading car. Electric, vacuum or air brakes can be used in the same way. It matters not how many cars we have in a train—one or fifty. Each car adds its own power, and all work together. There is no dead weight to pull, as in the case of the locomotive. The passengers themselves furnish the weight for traction. The switching arrangements present no difficulties whatever. The motors can be reversed and run equally well in either direction. The train can be controlled from either end, and any increase or decrease in the number of cars will not affect the controlling mechanism.

New Electric Roads.

By the close of the present summer there is good reason to believe a large number of new electric roads will be put in operation. This supposition is referred to by *Bradstreet's* as follows: "The activity in street-railway matters this spring has been unprecedented. More roads are building than ever before. More roads are projected. More roads are changing their motive-power. More transfers of ownership have been made or are in progress. The chief cause of this is the spread of the belief in the economy and general desirability of the electric motor." The importance of these improvements in street car facilities in a city is referred to by a Cleveland paper, which, in commenting upon the electric railways of that city, says: "Cleveland has had its share of all this, and here, as elsewhere, the great progress made during the last few months toward general rapid transit on street railways has had a marked effect in the building up of outlying residence territory and in checking the tendency toward tenements and apartment houses. For this reason it is a most beneficent change in the conditions of life in large cities. The effect of better street-railway facilities is more homes—in the best sense of the word, more fresh air and green trees for people of modest means, and a greater aggregate of comfort and happiness."

WASTEFUL RUNNING OF ELECTRIC LIGHTS.—In the use of incandescent lamps it is too frequently the habit to run them at a higher candle-power than they are rated at, and higher than they will stand for any considerable length of time. While an incandescent lamp increases considerably in candle-power with a slight increase of current, the life of the lamp is decreased in a much greater ratio, for a lamp that will give 16-candle power at 110 volts will give 30-candle power at 120 volts. While this very nearly doubles the candle-power with an increase of less than ten per cent of current, the life of the lamp will be decreased nearly 90 per cent. As a lamp operated under conditions similar to the above would have a capacity of only about 30 per cent of what it would be if operated under conditions more favorable to long life, it is easy to be seen that running lamps above their rated candle-power is an expensive way of getting more light. When more light is required, it is much more economical to increase the number of lamps or use lamps of a higher candle-power. In either case, care should be taken that the conductors are capable of carrying the increased amount of current without overheating.—*Ex.*

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Half inch (1 square).....	1.00	2.50	6.50	22.00
One inch.....	1.50	5.00	13.00	42.00

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Our latest forms go to press on Thursday evening.

Entered at S. F. Post Office as second-class mail matter

SAN FRANCISCO:
Saturday, August 16, 1890.

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[NEW THIS ISSUE.]

Mining Geologist and Chemist—Dr. Willis E. Everette, Tacoma, Wash.
"A Rigid Earth"—J. C. Ward, Visalia, Cal.
See Advertising Columns.

Passing Events.

Wednesday of this week was the first day on which the Government has purchased bullion under the new Silver law. It is said that the largest offers to the Government from New York were made at 113¾. Ahout 1,000,000 ounces were honght at ahout $1.1254.

The new cruiser San Francisco, whlch has been tried several times in the hay, will he soon ready for her test trip. This oruiser, built in this city, is a fine vessel and her performances thus far indicate that ahe will make high speed and he in every way satisfactory.

Preparationa for the comlng Mechanics' Fair and for the celebration hy the Native Sons of the 40th anniversary of the admission of California into the Union are going on satisfactorily, and it is expected both events will bring many thousands of people to San Francisco ln September.

A great deal of interest is manifested jnst now in the new mining districts in Washington, and prospectors are husy in all directions. Most of the region has heen neglected hy miners, hut it is prohable aeveral good camps will be developed this winter.

W. H. CLARK of San Diego, who lately started a line of steamers between San Diego, the Hawaiian Islands and San Francisco, says the Hawaiian Congresa has introduced a bill giving the line a subsidy of $24,000.

Assays and Mill Losses on the Comstock.

An anslysis of the quarterly bullion reports of the mines now producing ore on the Comstock lode is full of interest to stockholders therein, though showing a condition of affairs that is not calculated to encourage them or induce others to purchase shares. Below is given a tabulated statement whioh shows the results of the working for the last qnarter:

	Ore Extracted Tons.	Gross Yield.	Costs and Charges.	Profit.	Loss.	Average Yield per ton as per Bullion Report.	Average Pulp Assay for quarter.	Per cent of Pulp Saved.
Con. Virginia and California	35,485	$512,370.27	$402,876.01	$20,432.56		$14.60	$ 3.84	65 85-100
Justice	2,253	31,375.10	31,237,361.44	46,426.58	98,639.41	13.92	2.80	65 76-100
Crown Point	6,065	87,303.49	3,659.09			14.26	35.25	85
Overman	4,233	76,045.32	2,487.31			17.96	21.50	84 7-10
Alta	4,250	40,138.38	57,554.24	16,303.37		9.44	23.05	41 82-100
Cholar	6,881	97,914.04	98,043.20		817,215.86	14.05	29.17	76 5-10
Savage	6,063	90,912.00	97,705.76		152.22	16.95	21.85	65 2-10
Hale and Norcross	14,238	135,749.31	129,310.65	6,702.24	14.90	9.57	71 8-10	
Yellow Jacket	4,801	65,508.38	71,160.71	5,555.33	13.85	21.50	64 41-1 0	
Challenge	760	10,898.28	28,128.06	17,720.78	13.96			
Confidence	1,292.66	18,942.63	18,942.63	17,649.97	12.20			
Con. Imperial	2,736.21	29,362.45		26,556.27	13.90			
Totals	87,908	$1,375,102.19	$1,237,361.44	$46,426.58	$98,639.41	$14.60	$ 3.84	65 85-100

As will he seen by reference to the table, 35,485 tons of ore from the Consolidated Virginia and California produced but $1184 25 more profit than 4233 tons from the Overman, the ore from the former being worth (according to the average quarterly pulp report) $1.09 per ton more than that from the latter.

This difference is dne to the fact that the mills running the Con. Virginia ore saved 19 35-100 per oent less of the pnlp assay value of the ore than the mill running the Overman ore. In other words, the Con. Virginia crnshed over eight timea as much ore as the Overman and produced only $1184.25 more profit, the ore from the Con. Virginia being worth $1 09 per ton more than the Overman ore.

In the Alta Mining Company's returns there is a still greater differenoe. They saved but 41 22-100 per cent of their pnlp assays and hrought the company in deht $17,215.86. Their average pnlp assay for the quarter waa $23.05 per ton, which was $1.80 per ton more than the Overman, and they milled 27 tons more ore.

When it is understood that 85 per cent of the pulp assays can he easily ohtained, the frightful loss to stockholders oan be seen. If the mills running the Justice and the Overman ores can save 85 75-100 per cent and 84 7-10 per cent respectively, there is no good reason why mills running the ore from the other mines cannot do the same. It must be nnderstood that the tailings from the ore goes to the profit of the mills and is lost to the stockholders. To give an idea of what these losses are, they have heen put into figures:

To Con. Virginia and California, the difference between 85% and 65 35-100%.....	$154,424 30
Savage, difference between 85% aod 68 2-10%	22,698 24
Hale and Norcross, difference between 85% and 71 8-10%.....	34,405 80
Chollar, difference between 85% and 76 5-10%	11,232 71
Alta, difference between 85% and 41 22-100%	42,983 40
Crown Point, difference between 85% and 72%	25,298 40
Total.....	$291,042 85

This went to the profit of the mills. In addition to this they received $7 per ton for milling 87,303 tons of ore—$611,121—whlch added to the above amount makes the snm of $902,. 163.85 which went to the mill-owners for the quarter.

It will he noticed that in no instance is the assay value given of the ore at the various mines before dumpling it into the chutes for the mills to work on. The stockholdera of the various companies have the privilege of guessing at that, but that the large amonnt given above is not all that drops into somebody's pocket at the stockholders' expense, is shown hy the sworn testimony of the superintendent of two of the chief ore-produoing mines on the Comstock. In answer to the qnestion whether he fonnd any difference between the mine and mill assays (before ornshing) of the ore delivered to the mills by the two companies he represented, he answered: "Well, they differ, perhaps, $10 to $12 per ton; they differ as all mines differ. There is no difference from any other mines. The history of the whole business is that there is $10 or $15 a ton difference hetween the battery samples and the car samples; in other words, we never get within $10 or $15 of what our car samples call for." (This testimony is signed by the superintendent mentioned.) If this gentleman makes no mistake, then the stockholders are out $12 50 per ton, less 15 per cent more on 87,303 tons, or $927,. 599, whloh added to $902,163.85 makes the enormons sum of $1,829,762.85 which went to the mill-owners of the Comstock during the quarter ending Jnne 30, 1890. Not one mine paid a dividend out of the earnings for this qnarter.

Is it surprising with this showing that the mill-owners of the Comstock are the millionaires, while the stockholders are its psupers?

The Alta, Chollar, Savage, Hale and Norcross, Jacket, Challenge, Confidence and Con. Imperial show losses. In at least five of these companies the stockholders will be assessed to take out ore which if handled properly wonld pay dividends. The figures show a loss of $52,259.25 on 87,303 tons of ore, whereas if it had been worked to 85 per cent of the pulp assays (without considering what the ore assayed at the mines), the same ore wonld have shown a profit of over $250,000.

Further comment is unnecessary. The figures speak for themselves.

Mineral Lands in California.

It did not take the jnry very long last week to decide the qnestion of mineral or agricnltnral land in the Eagle Bird mine case, and the decision is one that relieves miners all over the country. Purchasing so-called agricultural land on odd sections from a railroad company was a pretty easy way for men to get hold of valnable mining property, and if the aystem could have heen maintained many men would have had to buy their own mines from somebody who came along a dozen or so yeara after they located said claims.

However, this decision pnts a stop to that practice, for the present at least. The fact of the matter is, that the inquiries as to character of land are entirely unsatisfactory. A few men who do not pretend to know mineral ground when they see it, swear that so far as they know there are no minerals, and immediately the land becomes agricnltural. No tronble at all is taken to get adverse testimony or that of an expert. Unless aome one is personally and directly intereated in the tract as a miner, no one appears to conteat the nsually worthless testimony offered. In this way within the past few years large tracts of land have been taken up nnder agricnltural title where there are plenty of mining claims or proapecta. No one county in the State is free from this practice, as we have before ahown in the PRESS.

When in addition, the railroad companies also claim the minerals on odd sections, it narrows down the field of the prospector aud miner to very small proportions. The mining pnblic is to be congratnlated on the result of the Eagle Bird case in the courts, since it settles a question which clouded titles to many hnndreds of mines, developed and nndeveloped.

WATER TRANSPORTATION.—Thomas J. Vivian of San Francisco has heen appointed Special Agent of the Eleventh Censns to collect the statistics of water transportation on the Pacific Slope, the Territory of Alaska excepted. All correspondence which managing owners of vessels have heretofore had with the Census Office has heen turned over to Mr. Vivian, and all further correspondence may he carried on with him.

A PATENT CONTROVERSY.—The suit of F. A. Huntington against the Risdon Iron and Locomotive Works has heen on trial hefore a jury this week in the United States Circuit Court. Hnntington seeks to restrain the defendant from infringing on a quartz mill patent, and to recover $50,000 damages.

An Electrical Exhibit.

The Mechanics' Fair this year will open on Sept. 18th and close Oct. 25th. Efforts are being made to canse this to be the most attractive exposition ever held here. A special featnre will be a separate electrical exhibit, including the varied applications for heat and power. The entire Grove-street side of the pavilion has been set aside for that purpose, besides room for the dynamos in the machinery hall. This will be the first time that snch an exhibit has been seen on this coast. The electrical companies are expected to make exhibits. There will be displays of arc and incandescent lights, motors, batteries, machinery and various forms nf electrical apparatus. A special attraction will be a column of light eight feet in diameter and 26 feet high placed in the center of the main aisle, the same as shown at the Paris Exposition and lately at Lennox Hall in New York, where for a number of weeks it drew thousands of visitors.

The United Edison Manufacturing Company has agreed to display the models and machines of all the electrical inventions of Edison, including the telephone and phonograph.

The California Electric Light Company is now engaged in designing some new and startling featnres of the power of electricity, as well as a display of arc and incandescent lights.

The Electrical Engineering Company has also consented to make a display of new improved motors and nther applianoes invented hy Professor Keith. These, together with a display promised by the Thomson-Houston Electric Company, the Heisler Long-Distance Incandescent Light Company and the Westinghouse Electric Company, should make an excellent display.

We suggest to the management, in connection with the application of electric-power to mining, that they might have a stamp-mill run by electricity, carrying the power say three or four miles by extending the wires round and round the building. A mill, pumps, hoist, drills, compressors, etc., could he thus shown at work, and exhibit in a practical way what electricity can do for mining. It would not be difficult to arrange this, and it would attract great attention. Miners read about snch things but have no opportunity to see them at work, there being only one in this State. Such a plant, in a central place like San Francisco, would bring many visitors.

California Ores and Minerals.

The secretary of the State Board of Trade haa issued a special circular to the mining counties asking them to represent their sections in the traveling exhibit of "California on Wheels" by sending specimens of ores and minerals. An exhibit is also wanted in the Board of Trade rooms in San Francisco. It is unfortnnate that there seems no other way of repreaenting the mining industry than by ores and minerals. A county with only half a dozen partly developed mines can often make as fine a display as one with some hundreds. It would be much better to have relief maps showing the locations of mines that are being worked, so colored and formed as to indicate the extent of the industry in any one section or region.

The mining community is asked so often, for many purposes, to contribute specimens, that it becomes a nuisance in time. The State Mining Bureau, with its fine, large collection and countless duplicates, could easily arrange a typical collection of ores and minerals, properly located and identified, and lend it to the Board of Trade for the traveling exhibit. Both institutions represent California, and one could easily help the other.

It is suggested that the State Board of Trade see the trustees of the Mining Bureau and get the latter to arrange a small collection suitable for sending around the country with the "California on Wheels," so that mineral as well as agricultural resources would be properly represented. This would save the time and trouble necessary to make collections from the counties and answer the purpose of advertising the mines just as well.

IT IS said that D. O. Mills and J. P. Jones have made extensive purchases of mining properties in the Death Valley region, and that they will in the near future inaugurate operations on a large scale.

Western Lead Smelting.

At Argenta, Beaverhead county, Montana, the St. Louis & Montana M. Co. made in 1866 the first serious attempt at regular smelting in the few Western Territories. Up to that time the hackwooda hearth, the Scotch hearth and its improved congener the American hearth, such as were to be found in the lead mines of Illinois and Missouri, were the only forms of smelting apparatus to be found in the far West. The St. Louis & Montana Co. adopted the Freiberg double-shaft furnace of the type used in Germany for the reduction of lead ores. Figs. 1, 2 and 3, taken from the drawings made at Freiberg, in Saxony, Germany, give all the necessary plans of such a furnace. Fig. 1 represents a section through the breast from front to rear; Fig. 2 represents a section through the furnace at right angles to Section 1; Fig. 3 represents a ground plan of the hearth with the accompanying tap basin and tap canal. The following description was contributed to the Eighth Annual Report of the State Mineralogist by W. S. Keyes, a trustee of the State Mining Bureau:

The pillars inclosing the furnace were made of granite or gneiss, having a face of over three feet, and alone contained material almost sufficient for the whole of a modern furnace. A fire-brick lining extended from the ground floor of the furnace to a point about one foot and a half above the tuyeres. It will be observed in the section, Fig. 2, that a partition wall extends from the top of the furnace downward to a point about two and a half feet above the level of the tuyeres. This wall rests upon an arch sprung from front to rear of the furnace, and was made of common brick in the upper portion and of fire-brick in the lower courses. The object of this wall was to insure a uniform descent of the smelting mixtures. The bottom or hearth of the furnace was composed of a mixture of charcoal or coke-dust and clay, well tamped in, beneath which are deposited a mass of rubble, which serve as an exit for the moisture contained in the brasque. A hole was cut through the hearth lining to the exterior tap basin. The furnace could smelt from six to ten tons in 24 hours. The Montana ores to be treated consisted of oxides, carbonates, sulphates and sulphurets of lead, usually found in the magnesian limestones of the far West. They afforded an ample percentage of lead for smelting, and were more than usually rich in silver, 200 and 300 ounce ores not being uncommon. They did not require any considerable amount of iron for fluxing. The price paid for smelting was $100 per ton. Nevertheless, on account of breakdowns and delays, bad charcoal, inexperienced workmen and an irregular supply of ore, the works were not a financial success, and, under the advice of the writer, were closed down and smelting discontinued. The work-lead or base bullion obtained was repelled in a large German cupel hearth, and 30 tons were put through in three days and two nights. The resulting silver was broken up, cast into molds and shipped to its destination.

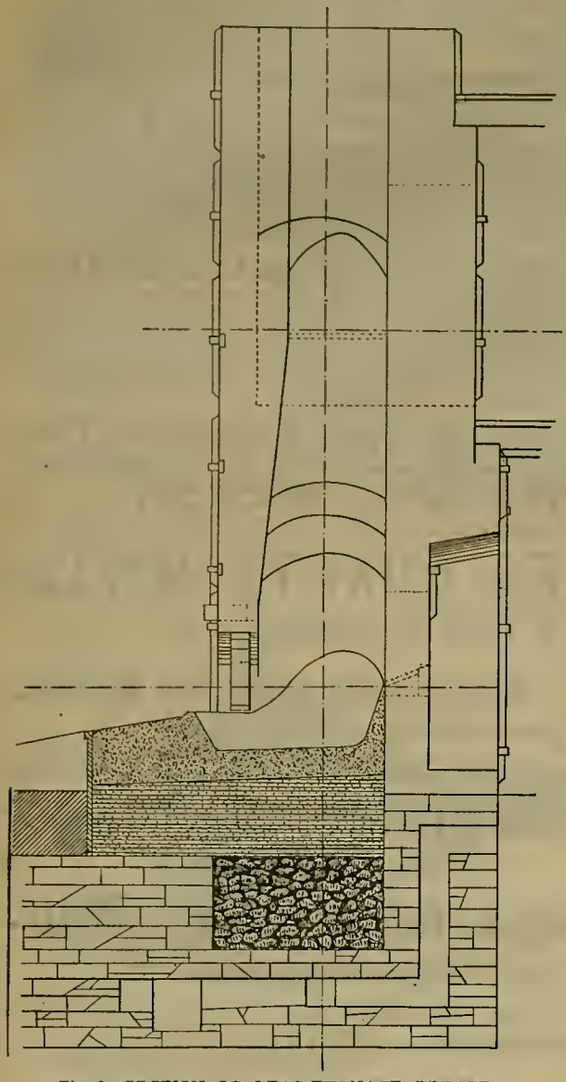


Fig. 1.—SECTION OF LEAD-FURNACE BREAST FROM FRONT TO REAR.

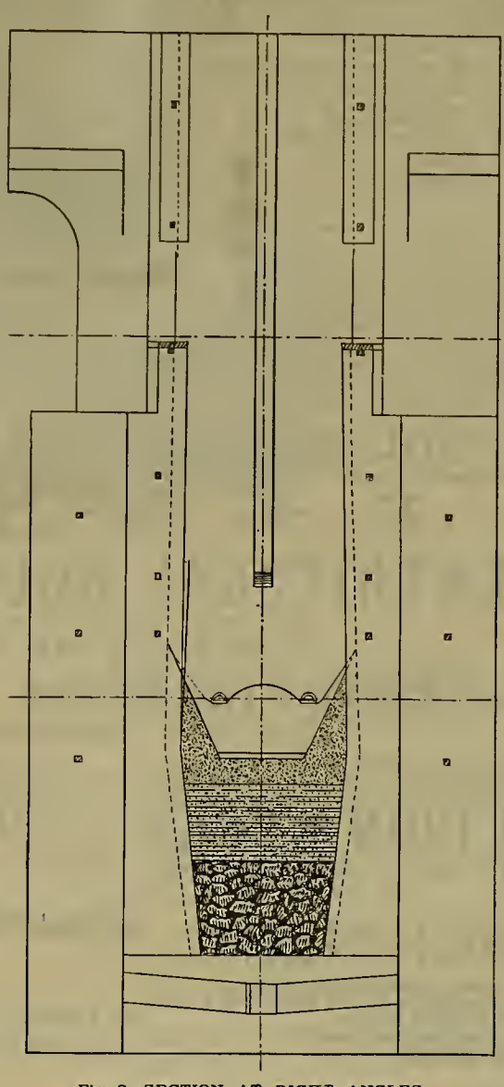


Fig. 2.—SECTION AT RIGHT ANGLES TO FIG. 1.

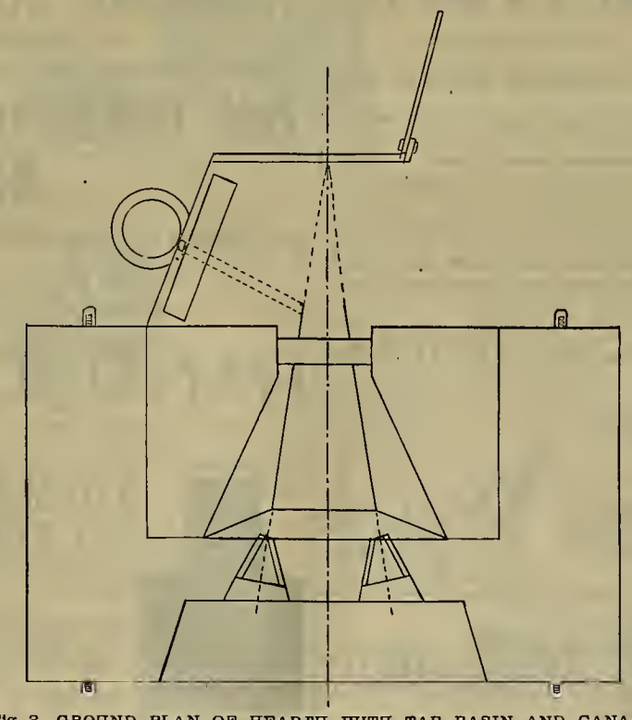


Fig. 3.—GROUND PLAN OF HEARTH WITH TAP BASIN AND CANAL.

In 1867 the Trinity and Sacramento Mining Co. acquired certain mines in the vicinity of Oreana, Nevada, and erected works. The ores were docile, but contained a large amount of antimony. A fair average, perhaps, would be some 30 per cent of the latter metal. Much of the ore was rich, in value from $80 to $200 in silver per ton. The furnaces were somewhat similar in form to that already described at Argenta; they were, however, 30 inches square, and were capable of reducing in 24 hours about eight tons of ore. The base bullion so obtained required a preliminary calcination before it was repelled. This calcination was performed in an iron pan 13 feet long, 5½ feet broad and 10 inches deep, with an initial charge of 12 to 15 tons. As the lead was purified, an additional amount was added until from 20 to 25 tons would be more or less thoroughly purified. This process required about ten days. The lead was then repelled in a long cupel hearth with movable tests set upon wheels. The test was made of an oval iron frame, five feet long, about 40 inches wide, and was filled with a mixture of bone-ash and willow ashes. So impure was the work-lead as it came from the smelting furnace, that a bar, when cold, if carelessly let drop, was often broken in two. This repellation of the lead *in situ* was rendered necessary from the fact that the overland railroad had not yet reached Oreana, and the long haul to a market wholly ate up the value of the lead. As soon, however, as the railroad was completed to this point the base bullion was sent to San Francisco to be refined.

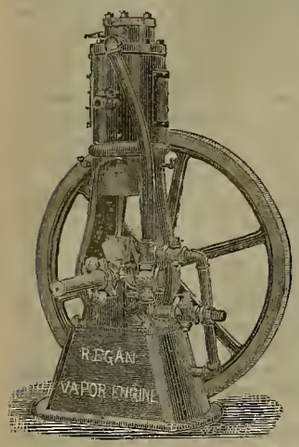
In 1870 several smelting furnaces, mostly small, were built at and near Shermantown, Swansea and Hamilton, White Pine county, Nevada. One of these, situated at Swansea, and originally built by Joseph Moshemier of San Francisco, was under the charge of the writer and Mr. O. H. Hahn. The smelting ores of White Pine county at and near Hamilton, were eminently basic. They were poor in silver, but abundant in lead carbonates, and in so far desirable and easy to treat. Owing, however, to an absence of quartz in the ores themselves, and the difficulty of obtaining alliceous ores for fluxing purposes, their reduction gave rise to the formation of "anws" innumerable, which hindered the smelting and often necessitated the blowing out of the furnace. These works produced, in the course of a few months, above 1000 tons of base bullion, and resulted in a gross financial loss of $30,000, after which experiment the furnaces were closed down and smelting abandoned. A like fate befell all the smelting furnaces in the vicinity of Shermantown and Swansea. There was no possible profit in smelting. The ores were exceedingly poor, and the owners of the mines asked such a price for them that the furnaces were unable to exist.

A curious fact in connection with smelting at this place may here be noted, viz., the behavior of mountain mahogany charcoal in the blast furnace. This wood, as is well known, is of a very firm, compact texture, and in the process of carbonization becomes thoroughly burnt out, so to speak; and as a result, when this charcoal is put into the furnace and the charge thrown upon it, it becomes crushed to an almost impalpable powder, so that the blast cannot force its way through, and strange as it may appear, this fuel actually put the fire out. So pressing was the need of silicious ore for fluxing that Mr. Hahn and the writer cast about them for a substitute. They hit upon the use of the clay slates, which were quite abundant in the neighborhood, and this was, as far as the writer is aware, the first attempt to make aluminate instead of silicate slags. The experiment proved a success.

A DEMAND FOR GOLD.—Assistant United States Treasurer Jackson reports an unusual demand on the Sub-Treasury for gold, many people bringing United States securities and converting them into the yellow metal. Mr. Jackson does not know whether there is any particular significance in the movement in connection with the recent silver legislation; but if it is general in the East, as well as here, he thinks that it may have been suggested by the enemies of silver.

SOME 700 gold bars, worth in the aggregate $4,000,000, were shipped to Europe from New York, one day last week.

REGAN VAPOR ENGINE.



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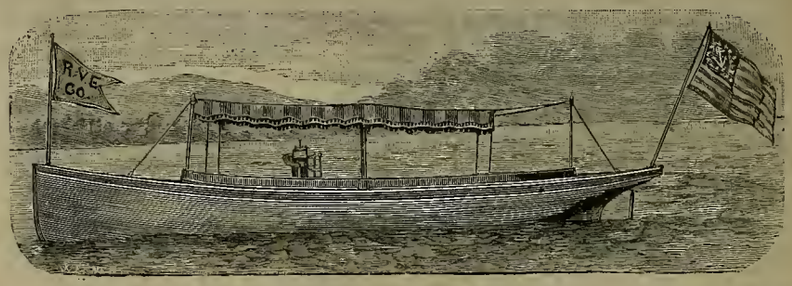
Yours truly, GEO. HAAS.



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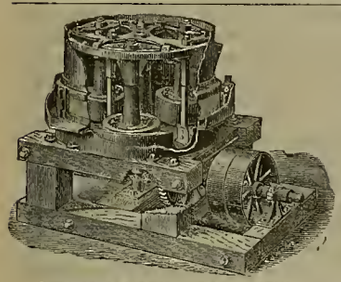
The uece for small steamboats and launches are innumerable; they are convenient and serviceable for transportation, and are a cource of pleasure for those who are fond of sailing. But many have been deterred from purchasing such boats, because of the trouble and inconvenience of using coal, and the necessity of obtaining a Government license, engineer, etc. Our motor does away with these objections. The small space taksn up by our engine in the boat **gives more room**; the boat will seat twice as many persons as one the same size fitted up with a steam engine. It takes only **two minutes to get under headway**, and can be stopped when running at full speed within the length of the boat, this reverse motion being instantaneous and effective. We carry in stock six regular sizes of hulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos. Kane & Co., Racine, Wis.

REGAN VAPOR ENGINE CO., 221-223 First St., San Francisco, Cal.



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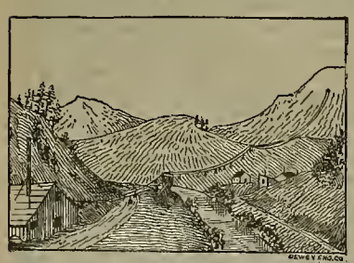

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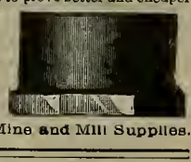

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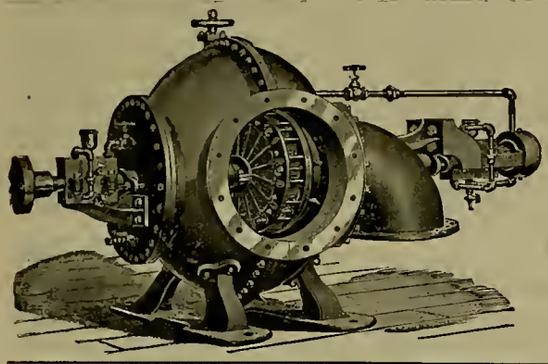

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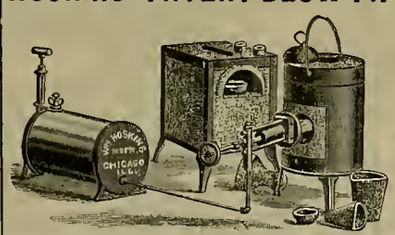

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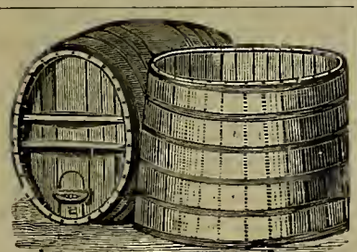

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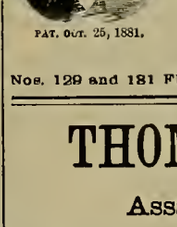

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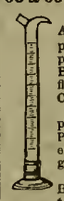

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

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BATTERY SCREENS.

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HOT AND COLD BATHS FREE.

Terms, Board and Room, $1.00 per Day And Upward.

Rooms with or without Board.

Free Coach to the House

J. POOLEY.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 14, 1890.

General trade the past week has been fairly active for the season. The high prices ruling for farm products and the general activity in all mining districts, together with wage-earners well employed at good pay, inspire confidence in the future.

The local money market is fairly easy. The call for funds for crop purposes continues free, while remittances from the interior show an increase.

The steamer Belgic, hence Aug. 12th for China, took out the following treasure: Mexican dollars, $259,013; gold coin, $20,695.

MEXICAN DOLLARS—The market has been quite active at 88 to 88½ cts. At the close it looks as if another advance will be made at an early day.

SILVER—The market here held to $1.11½ up to Wednesday, when quotations were withdrawn. All large offerings have to be made direct to the Department at Washington. The action of the Department in keeping prices paid for silver a State secret is very generally condemned as being in the interest of Wall street and other speculators. It is contrary to the spirit of our Government and should not be tolerated, for it makes the Department a speculator in silver, which was not intended under the present law. In England the price paid by the Exchequer is made public, and if it should be repressed the House of Commons would by vote inquire into the reason for suppressing the information.

Senator Teller has introduced into the U. S. Senate a hill calling for the free coinage of silver when the price reaches par. This is a move in the right direction, which should be passed by Congress.

The advance in silver abroad and its sensitiveness to outside influences are confirmatory of the position taken by this paper nearly one year ago that the supply is light.

The London market is higher to-day, being quoted at 51 5/16d. It is reported that the Mint paid on yesterday over $1.13 per ounce for silver.

The Mint's counter rate is $1.12½ for small quantities. For large quantities selling offers have to be submitted to the Department at Washington.

QUICKSILVER—The market is barely steady. The demand is said to be fair. Receipts the past week aggregate 348 flasks, and exports by sea, 16 flasks to Mexico.

BORAX—Receipts the past week aggregate 2052 centals. The demand continues fair, with the market steady.

LIME—Receipts the past week aggregate 3975 hhls. The home demand is reported to be good, while the shipping inquiry is light.

COKE—Imports the past week aggregate 1680 tons from Cardiff. The market continues easy.

IRON—Imports the past week aggregate 583 tons from Cardiff. The local market is firm with a fair consumption reported. Eastern and European advices, while reporting a dull market, state that there is a strong undertone.

TIN—The market is easy for both plate and pig. Late English cables report an active and strong market for both pig and plate. The advance in silver is in favor of higher prices abroad for pig.

COPPER—The market has held easy throughout the week. The East reports trading fair, with the market lower. A London cable to the *Iron Age*, Aug. 7th, says: Statistics show large supplies and deliveries last month, with a decrease of 891 tons. The amount held by the Societe des Melaux is now only 2000 tons, against 179,000 tons 16 months ago. Transactions in furnace material have been quite heavy latterly.

COAL—Imports the past week aggregate as follows: Seattle, 4008; Tacoma, 6100; Nanaimo, 2320; Departure Bay, 1945; Philadelphia, 399; Union, 4300; Port Townsend, 1100; Coos Bay, 700; total, 20,872 tons. The tonnage to load, loading and on the way from Australian ports is as follows: Newcastle, N. S. W., 53 637 tons; Sydney, 11,201 tons. Late cablegrams from Australia report tonnage scarce, and as the above coal is said to be cared for, our market for loading is strong at a slight advance. The strike at Wellington is still on, but the mines are turning out coal with non-union miners. The output of coal on this coast is steadily increasing, but the demand is also increasing.

Eastern Metal Markets.

By Telegraph.

NEW YORK, August 13.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	50 13-16	1 11½	$16 90	$4 47½	$20 90
Friday	51	1 13	16 90	4 45	20 90
Saturday	51⅝	1 12½	16 85	4 45	20 90
Monday	51½	1 13½	16 85	4 45	20 95
Tuesday	51¼	1 12½	16 85	4 50	20 95
Wednesday	51½	1 12	16 85	4 47½	20 90

NEW YORK, August 11.—Quicksilver and Borax are unchanged. Copper is barely steady at $16.85@17, and Arizona at $15@15.50. Pig Lead toward the close showe more strength

Coal.

TO LOAD.	Per Ton.	SPOT FROM YARD.	Per Ton.
Australian	$ 7 75@8 00	Wellington	$ 9 00
Liverpool Steam	8 00@ 8 25	Greta	8 50 @ 9 00
Scotch Splint	8 25@8 37½	Westminster Brymbo	9 00
Cardiff	8 50@—	Nanaimo	9 00
Lehigh Lump	16 50@17 00	Sydney	8 50 @ 9 00
Cumberland bk	13 50@—	Gilman	6 50
Egg, hard	15 00@—	Seattle	6 50
		Coos Bay	6 00
CANADIAN ANTHRACITE COAL.		Cannel	12 00
Egg, ship side	$12 50	Egg, hard	16 00
Egg, yard	15 00	Cumberland, in sacks	16 00
Stove, yard	15 00	do. bulk	15 00
Nut, yard	15 00	Wallsend	9 00@ 9 50
		COKE.	
English, to load	$12 00@13 00		
English, spot, in bulk	13 50@15 00		

THE total yield of the Con. California and Virginia mine for the ten months of the current fiscal year ended August 1st was 106,796 tons of ore, producing bullion valued at $2,043,976. Out of this sum, $270,000 was disbursed in dividends to shareholders.

Mining Share Market.

The mining share market, the past week, while steadily setting off, has not sunk to as low prices as many well-informed operators look for. There is nothing in the situation to warrant the present depression, but, on the other hand, everything to inspire confidence. The mines never looked so well as they do now, with their miles of drifts, crosscuts, etc, running in all directions so as to prospect and develop the mines at less cost. The stealings that have been going on for years will soon be a thing of the past. This opinion is grounded upon the fact that never before was there an organized move to fight for reform—honest management of the mines; and this fight is being waged by the Mining Stock Association of this city. When the reform is brought about, every assertion made by the MINING AND SCIENTIFIC PRESS will be verified regarding the rich ore in some of the mines.

The better informed operators claim that the present move of the ring to depress the stock market is nothing more nor less than a big bluff so as to convince outsiders that there is nothing in the mines, so as not only to keep outsiders from buying but force them to sell the few stocks they have; and in carrying out this program large lines of marginal stocks have been sold by brokers, which, of course, *were* owned by outsiders, but are *now* owned by the ring.

Dealers must be careful in crediting reports of parties floating stocks of any mines not listed on the stock exchanges, that Commodore Flood and Col. Mackay control the mine, and that it is the coming bonanza.

A few years ago the late Archie Borland was a big trump to send prices of stocks up or down; then came Levy, and after him the ring played Col. Mackay, hut he has failed to draw; then Finlay of the *Post* was sent to the front, but this was a boomerang, and now, so rumor states, Commodore Flood will visit the Comstocks probably as a drawing card.

Overman's hullion output for July aggregated nearly $38,500, and Crown Point's $38,808. The former mine added to its cash reserve, while the latter company after paying all debts carried over a cash balance. Chollar's, Savage's, and Hale and Norcross' July bullion outturn are not given. Belcher's bullion outturn in last month aggregated $15 953.

Crown Point pays $7 a ton for milling ore, as does Belcher, hut the former gets a rebate of $1 a ton, while the latter does not.

Private news from the Comstock mines is hard to get, or, at least, that which is reliable, further than has heretofore been published. Official letters received yesterday (Wednesday) report that in cutting out a station in the north drift on the 1300-foot level of Savage they were in good ($40 to $60) ore, having a width of 18 feet. Crown Point is milling ore, but the battery assays are low. In Belcher active and favorable prospecting work is under way. The battery assays of the ore milled fell below $23 a ton. The repairs to the Hale and Norcross shaft will he completed this week, and the hoisting and milling of ore he resumed. The superintendent of Kentuck reports the prospects favorable for finding a body of pay ore on the 1000-foot level.

San Francisco Metal Market.

WHOLESALE.

	THURSDAY, August 14, 1890.	
ANTIMONY	22½@	—
BORAX—Refined, in carload lots	8 @	—
Powdered " " "	8 @	—
Concentrated " " "	7¼@	—
All grades jobbing at an advance.		
COPPER—		
Bolt	23 @	25
Sheathing	23 @	25
Ingot, jobbing	20 @	—
do, wholesale	18 @	18½
Fire Box Sheets	23 @	25
LEAD—Pig	4¾@	5
Bar	5½@	—
Sheet	7 @	—
Pipe	6¼@	—
Shot, discount 10% on 500 lbs	Drop, ₱ lb.	1 65 @ —
Buck, ₱ bag	1 85 @	—
Chilled, do	2 05 @	—
QUICKSILVER—By the flask	57 00 @	—
Flasks, new	— @	—
Flasks, old	45 @	55
TINPLATE—B. V., steel grade, 14x20, to arrive	— @	—
B. V., steel grade, 14x20, spot	— @	4 80
Charcoal, 14x20	6 75 @	7 00
do roofing, 14x20	6 00 @	—
do, do, 20x28	12 00 @	—
Pig tin, spot, ₱ lb	22 @	22½
CHROME IRON ORE, ₱ ton	10 00 @	—
IRON—Bar, base	3 @	3½
Norway, base	4½@	5½
STEEL—English, lb	16 @	20
Canton tool	9 @	9
Black Diamond tool	9 @	9
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—

	Spot.	To Load.
IRON—Clengarnock ton	34 00 @—	30 @ —
Eglinton, ton	34 00 @—	30 @ —
American Soft, No, 1, ton	— @32 00	33 @ —
Oregon Pig, ton	@33 00	— @ —
Puget Sound	34 00 @—	— @ —
Clay Lane White	— @28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	— @	— @ —
Langloan	34 00 @—	30 @ —
Thorncliffe	34 00 @—	30 @ —
Gartsherrie	34 00 @—	30 @ —
Barrow	34 00 @—	30 @ —
Thomas	33 00 @—	— @ —
Cargofleet	30 00 @—	26 @ —

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

DISSOLUTION OF PARTNERSHIP.—The dissolution of partnership between James M. Haven and Arthur F. Low, under the firm name of Haven & Low, is announced. James M. Haven will continue the practice of law at the former office of the above firm, No. 530 California street, in partnership with his son, Thomas E. Haven, under the firm name and style of Haven & Haven. Judge Haven has been known to us as an able and reliable attorney for over a quarter of a century and we bespeak for himself and son the continued patronage so well deserved.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Almont M Co	Arizona	2	½	July 12	Aug 13	Aug 30	S Harman, 302 Montgomery St
Belcher M Co	Nevada	49	50	June 27	July 31	Aug 21	C L Perkins, 327 Pine St
Bodie Cons M Co	California	12	25	June 16	July 22	Aug 22	B. L. Burling, 309 Montgomery St
Boua Fors M Co	California	1	5	June 19	Aug 10	Sept 5	E K Taylor, 12 Montgomery St
Cona Imperial M Co	Nevada	28	5	July 17	Aug 20	Sept 11	C L McCoy, 329 Pine St
Cons Pacific M Co	California	12	10	June 21	July 23	Aug 20	F E Luty, 330 Pine St
Crescent M & M Co	California	4	25	Jun 24	Aug 2	Aug 29	J H Isham, 310 Pine St
Crocker M Co	Arizona	9	15	June 16	July 25	Aug 25	N T Messer, 309 Montgomery St
Cruikshank C M Co	California	1	10	Jun 27	Aug 14	Aug 25	E J Koch, 211 Sansome St
Exchequer M Co	Nevada	29	25	July 10	Aug 14	Sept 4	C E Elliott, 309 Montgomery St
Golden Prize Con M Co	Nevada	4	25	Jun 19	July 30	Aug 18	O D Bennett, 330 Pine St
Gover M Co	California	4	25	July 15	Aug 20	Sept 6	Cray Dew, 13 and 15 Fremont St
Gray Eagle M Co	California	18	6	July 1	Aug 4	Aug 25	J M Buffington, 303 California St
Mayflower Gravel M Co	California	48	20	Aug 5	Sept 6	Sept 29	J Mor zio, 328 Montgomery St
Occidental Cons M Co	Nevada	7	25	Aug 5	Sept 11	Oct 7	A K Durbrow, 309 Montgomery St
Peer M Co	Arizona	9	10	Aug 7	Sept 12	Oct 3	N T Messer, 309 Montgomery St
Tierskoff C M Co	California	4	1	June 9	July 26	Aug 23	W J Garnett, 308 Pine St
True Cons M Co	California	9	2½	May 26	July 21	Sept 15	J C Bates, 434 California St
Union Cons M Co	Nevada	41	28	July 21	Aug 26	Sept 15	A W Barrows, 303 California St
Utah Cons M Co	Nevada	10	25	Aug 5	Sept 15	Oct 2	A H Fish, 309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Alta M Co	Nevada	L Osborn	309 Montgomery St	Annual	Aug 21
Baker Divide M Co	California	D M Kent	310 Pine St	Annual	Aug 18
Colorado River M Co	Colorado	J Treadwell	230 Montgomery St	Annual	Aug 18
Grand Prize M Co	Nevada	R R Grayson	327 Pine St	Annual	Sept 16
Independence M Co	Nevada	J W Pew	310 Pine St	Annual	Aug 18
Martin White M Co	Nevada	A B Cooper	325 Montgomery St	Annual	Aug 21
San Joaquin Coal Co	California	F Bonanana	438 California St	Annual	Aug 21

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Cato	309 Montgomery St	25	Apr 5
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	Jun 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California		Cross Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Aug 11

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 24.		WEEK ENDING July 31.		WEEK ENOING Aug. 7.		WEEK ENDING Aug. 14.	
Alpha	1.25	1.40	1.25	1.35	1.20	1.3	1.00	1.20
Alta	1.15	1.25	1.20	1 25	1.20	1.25	.95	1.05
Andes	.60	.75	.65	.70	.65	....	.50	.65
Belcher	2.55	2.95	2.50	3.30	3.10	3.45	2.70	3.15
Best & Belcher	3.65	4.20	3.75	3.90	3.05	3.55	2.75	3.10
Bullion	3.55	4.15	3.05	3.9	3.05	3.55	2.20	3.10
Bodie Con	1.05	1.20	1.15	1 25	1.20	1.30	.90	1.15
Bulwer	.25	.65	....	.30	.25	....	....	....
Commonwealth	3 45	3.70	3.25	3.50	3.00	3.45	2.95	3 05
Con. Va. & Cal	3.75	4.20	3.80	3.90	3 75	4.00	3.50	3 80
Challenge	2.75	3.0	2.75	3.15	2.35	2.8	1.90	2 25
Chollar	3.70	4.00	3 20	3.65	2.80	3.40	2.40	2.70
Confidence	....	....	6.87	....	6.00	6.12	5.00	5.75
Con. Imperial	.30	.40	.30	.40	.35	....	.30	.35
Caledonia	.40	.45	.40	.45	.40	....	.25	.40
Crown Point	2 60	3.0	2.65	3 10	2.70	2.95	2.21	2.75
Crocker	.20	.30	.25	.30	.25	....	.25	....
Del Monte	1.50	1.6	1.50	1.75	1 40	....	1 00	1.35
Eureka Con	4.50	....	3.75	4.25	4.15	....	3.95	4.25
Exchequer	.85	1.05	.85	.99	.65	.85	.60	.80
Grand Prize	....	....	.60	....	.55	.25	.45	.25
Gould & Curry	2.60	2 95	2 55	2.75	2.05	2 60	1.75	2.15
Hale & Norcross	2.75	3.10	2.60	2 8	2.55	2.75	2.05	2.60
Julia	.30	....	.20	.25	.25	....	.15	.20
Justice	1.45	1.55	1 40	1.50	1.40	1.45	1.20	1.30
Kentuck	1.30	1.45	1.25	1 40	1.20	1.30	.85	1.05
Lady Wash	....	....	.25	....	.35	.50	.30	.35
Mono	.60	.65	.65	.75	.50	.70	.35	.40
Mexican	3.05	3.40	3.25	3.65	3.15	3.45	2.85	3.15
Navajo	.60	.65	.50	....	.50	....	....	....
North Belle Isle	1.15	1.30	1.30	....	1.15	....	1.01	....
Nev. Queen	.75	.85	.85	....	.75	.80	.60	.70
Occidental	1.40	1.60	1.20	1.35	.80	1 15	.75	.90
Ophir	3.90	4.75	4.70	5.62	4.75	5.50	4.35	4.95
Overman	2.45	2 75	2 45	2.55	2.00	2.40	1.35	2.05
Potosi	7.50	8.25	5.37	7.75	6.12	7.12	5.25	6.62
Peerless	.20	.25	.20	....	.20	....	.15	.20
Peer	.15	.20	.15	....	....	....	.10	....
Savage	3 80	4.55	3.70	4.20	3.3	3 95	3.10	3.50
Sierra Nevada	1.70	1 95	1.65	1.90	1.40	1.70	1.05	1.25
Silver Hill	.35	....	.30	....	.25	.3"	.20	.25
Scorpion	.25	....	.25	....	.20	....	.15	.20
Union Con	2.60	3.00	2.65	3.00	2.45	2.85	2.25	2.60
Utah	.90	1.10	.90	1 00	.65	.90	.55	.65
Yellow Jacket	2.95	3.30	2.95	3.55	3 25	3.40	2.80	3.30

Sales at San Francisco Stock Exchange.

THURSDAY, Aug. 14, 9:30 A.M.

100	Exchequer		7fc
650	Gould & Curry		1.90
600	Hale & Norcross	2.15@2.20	
100	Julia		20c
100	Justice		1.35
100	Kentuck		1 05
100	Mexican		3.00
350	O hir		4.60@4.65
150	Overman		1.90
700	Potosi		5.50
100	Savage		3.45
600	Seg Belcher		1.20
500	Sierra Nevada	2.55@2.60	
250	Silver Hill		25c
310	Union Con	2.35@2.40	
100	Utah		65c
225	Yellow Jacket		3.00

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GEO. WILSON—Sacramento Co.
FRANK S. CHAPIN—Lake Co.
J. C. HOAG—San Francisco.
J. G. H. LAMPADIUS—Santa Cruz and San Benito Cos.
SAMUEL CLIFF—San Luis Obispo Co.
W. W. THEOBALDS—Orange and San Diego Cos.
C. J. WADE—San Bernardino Co.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
E. B. TAFT—Tulare Co.
W. B. FROST—Merced Co.
E. H. SCHAEFLE—Calaveras Co.
T. B. DAPRAY—San Francisco.
O. N. CANWELL, Carpinteria, Cal.
WM. M. HILLEARY—Oregon.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.
E. E. DEMING—Ashland, Oregon.
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R. G. BAILEY—Washington.

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New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

ALAMEDA M. & M. CO., Aug. 12. Capital stock, $100,000. Directors—J. T. Landregan, J. A. Hall, P. Mauve, W. C. Wright and James Shea.

CALIFORNIA CONTRACTING CO., Aug. 12. Object, doing general contracting work. Capital stock, $100,000. Directors—J. C. Robinson, J. H. Harbour, H. T. Jones, Wm. Liddington, M. R. Twormy.

PACIFIC BONE, COAL & FERTILIZING CO., Aug. 12. Capital stock, $200,000 Directors—Thos. Brown, A. Haas, F. H. Eichbaum, A. Haraszthy, S. A. Haas.

PEACE MAYNARD CO., Aug. 13. Object, to deal in real estate. Capital stock, $150,000. Directors—J. A. Maynard, H. L. Peace, A. Gould, Samson Moore and Wm. Hayward.

CALIFORNIA GASLIGHT & FUEL CO., Aug. 13. Capital stock, $10,000,000. Directors—W. H. Murray, Geo. E. Barnes, H. P. Cohen, Geo. Hazleton, W. B. Ewer, J. L. Boone, Francis Moore, W. C. Quinby and H. B. Smith, Jr.

BLUE LAKES WATER CO. (Oakland). Aug. 12. Object, to supply water from the Sierra to Stockton, Oakland, Alameda and other places. Directors—T. G. Phelps (President), V. D. Moody of Oakland (Vice-President), Daniel E. Hayes, J. W. Smith of Oakland, General R. W. Kirkham, H. D. Bacon of Oakland, Thomas Bell of S. F., A. T. Hatch of Solano, S. A. Marshall of S. F., F. K. Shattuck of Oakland and J. S. Emery of Oakland.

TIF. HAUSKINS and George Lovelock, Jr., have sold the gypsum deposits, which are situated about five miles east from Lovelock, Nev. The purchasers are San Francisco men and the consideration is $6000.

Assessment Notices.

GOVER MINING COMPANY—LOCATION of principal place of business, San Francisco, California. Location of works, near Dutch Town, Amador county, California.

Notice is hereby given that at a meeting of the Board of Directors held on the 14th day of July, 1890, an assessment (No. 2) of twenty-five cents (25c) per share was levied upon the capital stock of the Corporation, payable immediately to the Secretary, at the office of the Company, 13 and 15 Fremont street, San Francisco, California.

Any stock upon which the assessment shall remain unpaid on Wednesday, the 20th day of August, 1890, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 6th day of September, 1890, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

CRAY DEW, Secretary.

Office, 13 and 15 Fremont St., San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 18) levied on the first day of July, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Bogart, O H, Trustee	423	350	$ 21 00
" " "	424	650	30 00
" " "	447	5,000	300 00
" " "	488	105	6 30
Barrows, A W, Trustee	537	2 4	17 04
Bowers, D	370	20	1 20
" "	404	500	30 00
Buffington, J M, Trustee	527	2,500	150 00
" " "	528	2,000	120 00
Francie, H L, Trustee	444	1,500	90 00
Nash, H W	269	104	6 24
Nordman, Leon	514	100	6 00
Stout, C S, Trustee	476	2,000	120 00
Scarles, W A, Trustee	518	1,000	60 00
" " "	519	606	36 36
Stetson, A M, Trustee	520	5,000	300 00
Taylor, J M, Trustee	532	1,040	62 40
Wetzel, Theo, Trustee	215	50	3 00

And in accordance with law, and an order of the Board of Directors, made on the first day of July, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No 303 California street, San Francisco, California, on MONDAY, the 25th day of August, 1890, at the hour of one o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. W. BARROWS, Secretary pro tem.

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SAMUEL B. CONNOR, San Francisco, Cal.
ANDREW S. GRANT, San Francisco, Cal.

STATE OF CALIFORNIA, } ss.
City and County of San Francisco. }

On this 12th day of July, in the year one thousand eight hundred and ninety, before me, Geo. T. Knox, a Notary Public in and for the City and County of San Francisco, personally appeared Samuel B. Connor, of said City and County and State, and Andrew S. Grant of the same place, each personally known to me to be the persons whose names are subscribed to, and who executed the within instrument, and they acknowledge to me that they executed the same.

In witness whereof, I have hereunto set my hand, and affixed my Official Seal, at my office, in the City and County of San Francisco, the day and year in this certificate first above written.

[NOTARIAL SEAL.] GEO. T. KNOX, Notary Public.

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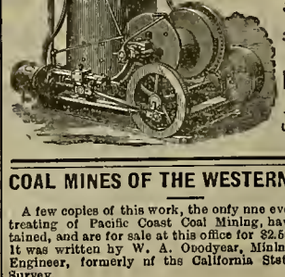

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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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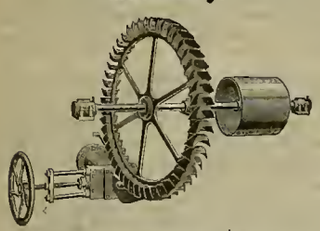

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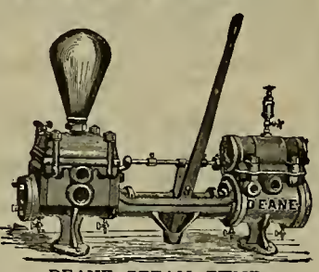

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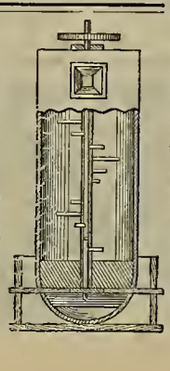

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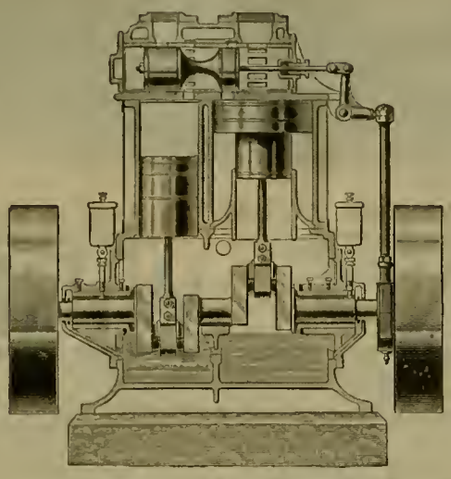

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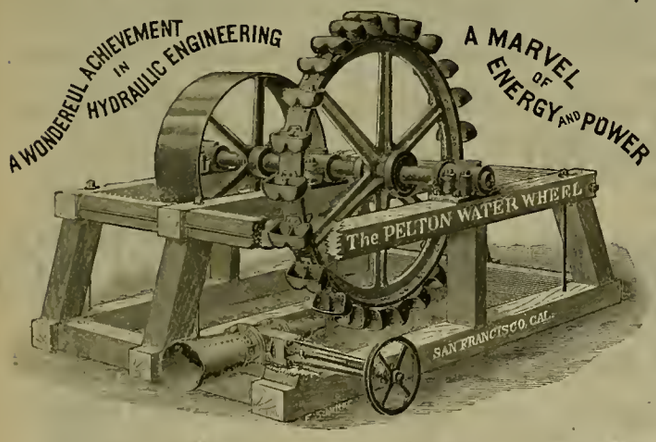
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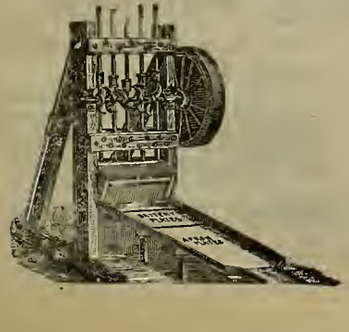

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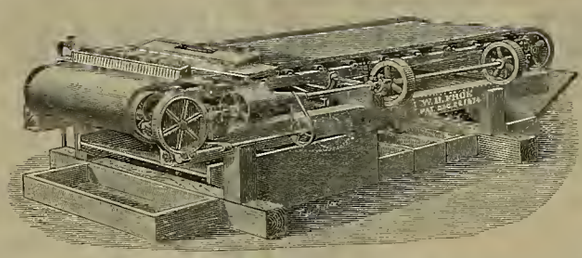

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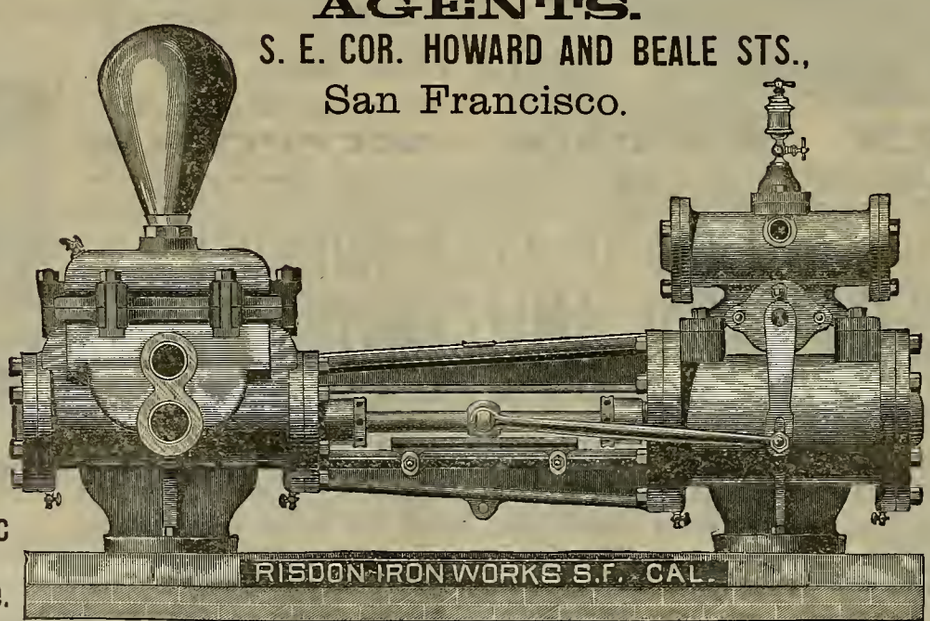

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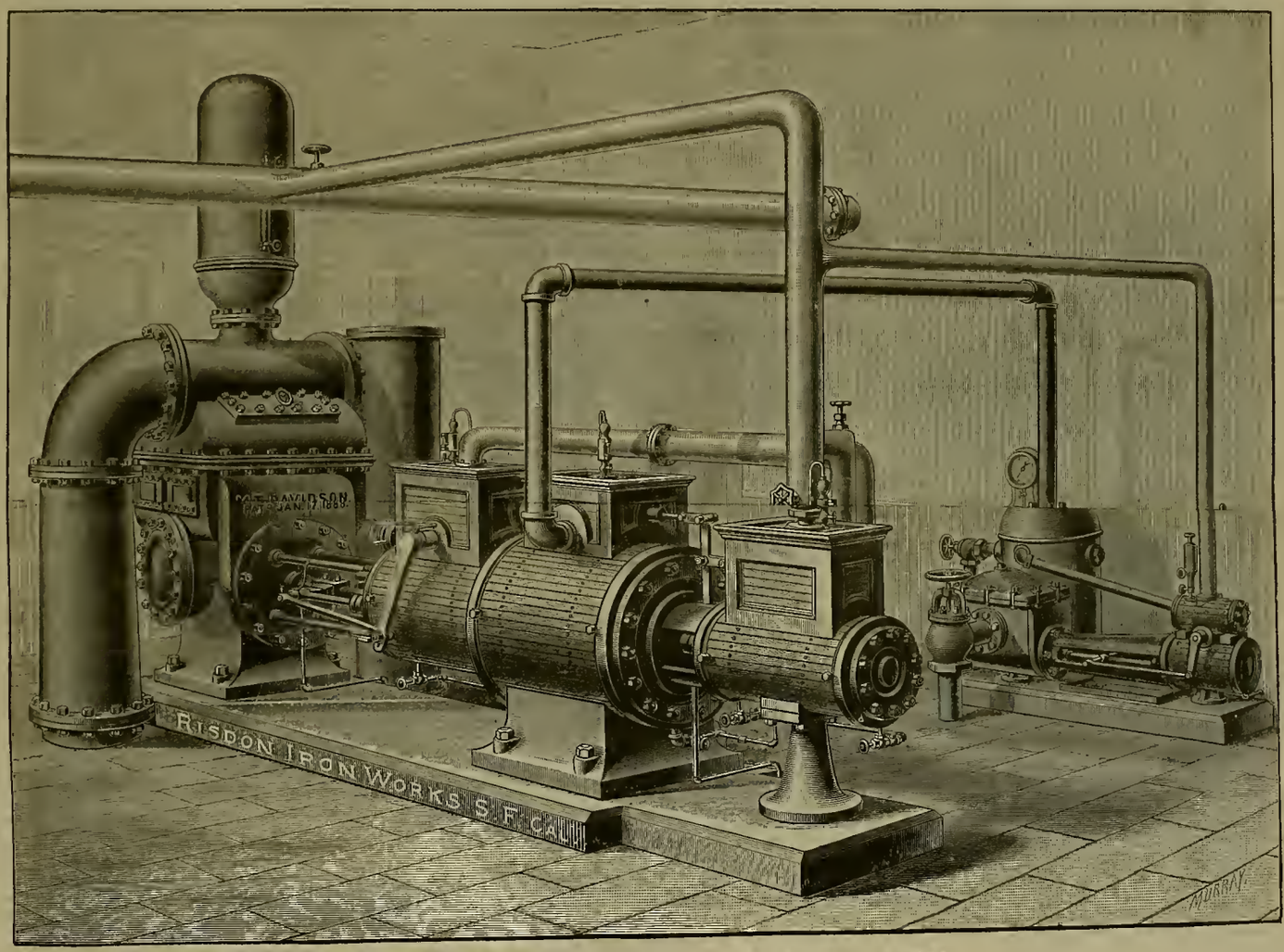
An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 8. DEWEY & CO., PUBLISHERS. SAN FRANCISCO, SATURDAY, AUGUST 23, 1890. Three Dollars per Annum. Single Copies, 10 Cts.

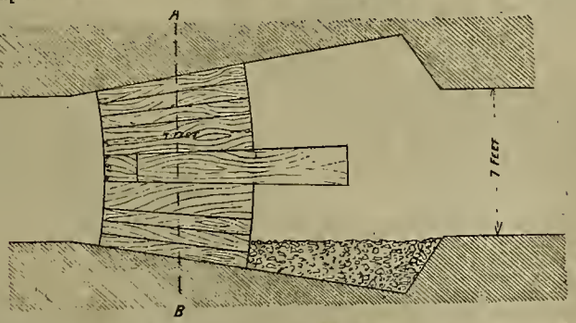


CONDENSING STEAM-PUMPING ENGINE, WITH TRIPLE CYLINDERS.

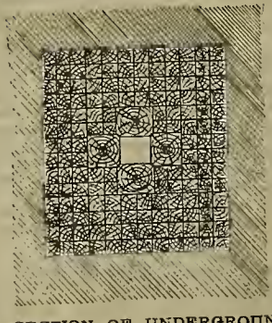
A Triple-Expansion Pumping Engine.

The accompanying cut represents a condensing steam-pumping engine with triple cylinders, 9, 14 and 24 inches in diameter, 24-inch stroke. It was built by the Risdon Iron Works of this city, on the Davidson system, for the town of Jamaica on Long Island, N. Y. The pump is 24 inches in diameter, and the duty 4,000,000 gallons per diem, though it has performed 50 per cent more than that without excessive piston speed. It is the first use of three cylinders with so high a degree of expansion of direct-acting steam pumps. Working at full stroke, the expansion is ten volumes.

The arrangement of three cylinders tandem, with the intermediate and low-pressure ones abutting, as shown, calls for a special arrangement of the piston-rods so as to avoid internal packing. The high-pressure piston at the rear end, or in the front of the drawing, is connected with the piston of the low-pressure engine in the middle. From the piston of the latter there are two rods passing alongside of the intermediate cylinder in tubes, provided with packing glands next the pump in front. These two rods are there keyed into a crosshead on the rod connecting the intermediate and pump pistons, so that the high and low-pressure pistons are on one rod and the intermediate and pump pistons on another, the two sets being connected by the side rods as just explained.



LONGITUDINAL SECTION OF UNDERGROUND DAM.—See page 126.



CROSS SECTION OF UNDERGROUND DAM.

COAL.—The strike of the Wellington miners has made a scarcity of coal in this city, as only 30 of the 900 miners are now at work. The Pacific Improvement Co.'s mine at Carbon Hill is also in some trouble, owing to an injunction served on the company by the Fish Commission for washing the coal in the Colorado river, thereby destroying the fish.

THE FOUNDRIES continue to work steadily along, and although there are more or less desertions of non-union men, others are immediately brought to fill their places. The foundrymen, though put to some inconvenience, have men enough in the molding departments to carry on their usual business.

THE Granite Mountain Mining Co., Montana, paid a dividend of 50 cents per share on the 11th inst., aggregating $200,000, and making a total of $1,600,000 paid this year.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Gold Belt of Northern California.

Ancient River Channels and Gravel Deposits.

NUMBER XI—CONCLUDED.

[Written for the MINING AND SCIENTIFIC PRESS by JAMES F. TALBOTT, Blue Canyon, Placer Co.]

Considering the present outlook for hydraulic mining, with all of the favorable indications staring the miner square in the face, and all of the advantages here presented, it is unaccountable that no effort is made to open out drift mines on the deep channel in this ridge.

The great changes in the character of the gravel mines, from the pioneer days to the present time, were so gradual that the point where one class apparently led into the succeeding one was rarely observed at the time.

Classes of Gravel Claims.

There are three distinct classes of gravel mines recognized: First, the bars, rivers, ravine and canyon diggings; second, the deep gravel deposits on the hills; third, the deep channels underlying the lava-capped ridges.

With but few if any exceptions, each class was first discovered by accident, and afterward the discoveries in that class were extended by a comparison with the conditions observed where the deposits of pay were found. The first discovery of gold in California by Marshall was by accident, on a bar on the South Fork of the American river. There was nothing peculiar or different in the conditions of that bar from any other on the South Fork or any other river bar. All of the conditions were observed on the bar where the gold was first found. On comparison, other bars were found to be exactly similar. The natural conclusion was that all river bars in the gold region contained gold, that truth of which was subsequently verified.

There is no account of the first discovery in ravines and canyons. It was no doubt by accident, for in many places in pioneer days the gold lay exposed on the surface in the gulches and ravines, many of which proved to be very rich. From this it was inferred that all ravines and canyons were rich, which proved to be a mistake, as the conditions for pay were not so well known then as now. This class of diggings was the only one known for several years after the first discovery and it was apparent from their character that they would be exhausted in the course of a few years. But before any appreciable effects from this source were felt, the second class of deposits on the hills was discovered in Georgia Hill. The discovery of this class gave promise of a more permanent character than the former and gave an impetus to prospecting that has never been equaled in the State. By a comparison with Georgia Hill the conclusion was jumped at that all gravel hills in the gold region contained rich deposits of gold. The result was the discovery and development of nearly all the hill diggings for 50 miles to the north on this gravel belt and added carloads to the product of gold. Previous to this, however, in a few places rich leads had been followed into the hill and were being worked, but these were considered as local peculiarities and had no general effect like the later discoveries.

Under Lava Ridges.

The third class comprises the channels under the lava ridges. An "accident" occasioned by a big slide on the south side of the ridge near Forest Hill revealed the conditions that led to the first discovery of this class here. By the same course of comparison in this class as in the others the discoveries were extended and the fact established of the existence of mines of a more permanent character than either of the others. The natural conclusion is that all lava-capped ridges of this character within the gold region contain similar mines, the correctness of which appears to be well sustained as far as developments and discoveries have been made up to the present time.

For the past 20 years or more I have entertained the views herein expressed; and following on this line of reasoning, by a comparison of the surface conditions observed on the Shady Run Ridge with those on the Forest Hill Ridge, the similarity is so striking that I believed the underlying conditions would be found to correspond, and that a deep channel could be found in the former similar to the one in the latter, running on the same course from northeast to southwest.

As an earnest of my confidence in the result, about 15 years ago I bought and located mining ground of considerable extent, covering the lava-capped ridge, for the purpose of prospecting, to determine the correctness of my views. I located and started a tunnel with the resolution to see if there was a deep channel underlying the ridge, and if so, to find the bottom of it, if I lived long enough. The undertaking was termed by local mining experts, most of whom were "cross-channel theorists," as "a d——d fool operation," and predicted I would strike high bedrock before getting back 500 feet.

A Practical Example.

For the want of means but little more than the required annual expenditure was done for several years. All efforts to procure any assistance from local capital were unavailing. Persisting in my efforts, I formed the acquaintance of an enterprising party of San Francisco who took a favorable view of the situation and was willing to put some money in the plant. Accordingly an adjoining location was made, and the claims consolidated under the name of the Elite Consolidated Mining Company. Work was then commenced and the tunnel that had been started was extended back into the ridge 1100 feet, from which point a shaft was sunk 158 feet to bedrock. [See engraving of section of ridge and gravel claim on another page of this number of the PRESS.—EDS. PRESS.]

About 600 feet east from the station at Shady Run, at the head of a ravine, where the rimrock has been carried away and exposes the cement to the depth of 50 feet, overlying 5 or 6 feet of fine quartz gravel on the bedrock, the tunnel, six feet wide and six high, starts in the rimrock on a drainage grade and runs on an air line, north 70° west, the distance of 1100 feet. It was known this was not deep enough to bottom the channel, if there proved to be one. The calculation was that the tunnel could be run in the cement at this point and a shaft sunk to ascertain the depth—much cheaper than any other mode of prospecting—and if pay was found the mine could be operated through the present works, which are substantial and constructed with reference to such a contingency, until a tunnel could be run to bottom the channel. From where the present tunnel starts in, the bedrock pitches gradually to the northwest and dips under the cement about 200 feet back. The tunnel passes about 200 feet perpendicular under the railroad right at the station. The cement along in the tunnel here is as hard and solid as ordinary slate bedrock. After passing some distance beyond the railroad to the west, strata of coarse sand were encountered. Occasionally the whole face of the tunnel would be in a bed of sand. On this account 400 feet of the back portion of the tunnel was substantially timbered. When coming into a solid body of the cement again, the shaft was started. At the depth of 35 feet the cement gave out, and 20 successive distinct strata of sand, gravel, clay and lignite were passed through before bedrock was reached. At the depth of 52 feet we came on to a stratum of solid, compact white clay. Immediately underlying this was found an unmixed bed of lignite three feet thick, composed apparently of a drift of wood, bark, leaves, grass and other vegetation, among which cedar bark and tamarack wood are readily distinguished. One of the curiosities found here might be of interest to the naturalist—that is, on the leaves of what appears to have been some kind of a water plant is found a small insect of a bright green color as natural as life. In size and color it resembles very much a small insect often seen skipping along on the surface of still water in streams or clay with lignite in thin layers intermixed all through.

At the depth of 100 feet we passed through a bed of pipeclay 22 feet thick. Below this was a few feet of sand and drift. The next below was as fine a body of smooth washed quartz gravel and cobble as I ever saw; and here the first color of gold was found 1100 feet back from the outside rim and about 500 feet from the surface on the ridge. In every pan of this gravel, fine colors of gold can be got. Where the gravel was struck in the shaft, it dipped to the northwest into the ridge at about 15 degrees, while the bedrock 25 feet below pitched in the same direction on an angle of 35 degrees, which induces the belief that this is the lower rim of the deep channel. When it is considered that the rimrock along on Canyon creek is about on the same level with the C. P. R. R., that this tunnel runs about one-fifth the distance through the ridge toward that rim, and that the bedrock pitching steep in that direction at the end of the tunnel is 350 feet below the railroad track, the fact is established beyond a doubt of the existence of a deep channel, which fact is *now* generally admitted.

Admitting the existence of the channel, the pull now is, you don't know if there is any pay in it.

Pay in Deep Channels.

The indications are as favorable and the presumptive evidence as strong in regard to the pay as to the existence of the channel; and it is the present intention of our company to demonstrate the former in as positive a manner as we have the latter, by running a slope from the end of our tunnel on a grade that will reach the bedrock 300 feet beyond the shaft, where it is confidently believed we will strike the original deposit of gold in the deep channel of the North Fork Divide, that will develop as rich as any found in the Gold Belt. The fact of the two ridges that form this divide uniting, as heretofore described, evidently shows their contents were derived from the same source. Upon reliable authority, the figures show that $100,000,000 of the contents of this divide have been realized in the output of gold since 1849, from the gravel mines alone, between the South Yuba and the North Fork of the American, the greater portion of which came from the Nevada Ridge. Owing to the peculiarity of that ridge in spreading out over a wide extent of country that was easily prospected, many of the rich mines were developed at small expense, which attracted the capital that subsequently developed the vast mineral resources of that section.

Shady Run Ridge.

The peculiarities of the Shady Run Ridge are its narrow, confined condition, with but few gravel deposits connected with it. In regard to its contents, nothing directly is known, but from all of the surrounding conditions, the natural inference is that it contains rich deposits of gold. It is situated right in the center of the Gold Belt, with rich drift mines both on the north and the south, and for 15 miles or more on either side the ridge, where the rim has been cut away to a certain depth, rich spots of pay have been found in the near vicinity and nowhere else. The millions of dollars in fine gold taken from the Dutch Flat and Gold Run mines unmistakably came principally from this ridge. With all of the favorable indications and advantages presented, with the exception of a few individuals gouging around in outside spots, there is not a drift mine between Bear river and the North Fork of the American. Why is this so? Simply because the drift mines of permanent value are buried deep beneath the lava-capped ridge, beyond the reach of the individual prospector's means, and companies with capital decline to take hold until something rich is developed.

Future Drift Mines.

The fact is now pretty well established that the future drift mines of permanent value will have to be sought for under the deep lava-capped ridges that overlie the ancient channels, and from a careful observation of the surface conditions and following on the line of natural methods here indicated, it is confidently believed that every ancient channel on the western slope of the Sierras within the Gold Belt can be as definitely traced out as those of the Middle and North Fork of the American.

Causes of Failures.

There are few localities in the mining region but what have been cursed with some bogus prospecting and mining operation managed by a class of "pedro" miners more for the purpose of the five or ten dollar a day salary than to obtain valuable results. The method is to make a haphazard location of a claim as near the town as circumstances will permit, or bargain with a silent partner for a worked-out claim at a round price. A forced and unnatural connection is made between the claim and every rich mine within the circumference of 40 miles. Some rich friend is taken into the secret of this hidden wealth and supplies the means to obtain it. After spending a few thousand dollars and getting nothing but favorable reports, the rich friend gets a "clue" and takes in the situation, curses the claim, the management and the whole section of country, and permanently retires from the business. Any other kind of business in the country besides mining, based and conducted on this principle, would result in failure. The principle of home rule will have to be adopted, so that each locality will have to stand on its own merits of [illegible] dom find many serious obstacles to overcome in their efforts to run every rich channel in the country through their claims. I would suggest a less difficult method, one with greater possibilities of valuable results—that is, to trace out the channels first, then make the location with reference to them. "In the days of old" all that was required to prospect and develop a rich mine was a mule-load of grub, a pick and pan. The changed conditions now demand considerable money, abundance of muscle and the power of steam. Where these are directed by honest, intelligent, practical miners, on sound business principles, the business of mining will be as successful as any other business in the country.

The "Blue Bucket" Mine.

In 1845, a party of immigrants under the leadership of Stephen Meeks, left the usually traveled route at the month of the Malheur river and traveled up that stream, intending to cross the Cascade mountains at the head of the Willamette valley. Cloudy and foggy weather set in obscuring the land-marks and the party got lost and wandered about the great basin in which Harney lake is situated, for some weeks, suffering intensely for food and water. During this wandering some one brought into camp some substance supposed to be gold dust. Out of this find has grown the mythical mine, sometimes called the Wagon Tire mine and sometimes the Blue Bucket mine. The term "Wagon Tire" was applied, because it is said in testing the substance, some of it was beaten flat on a wagon tire, from which circumstance it was concluded the substance was gold. When it was concluded that the yellow stuff was gold, one of the enthusiastic finders exclaimed: "Why! if that is gold, I can fill a mine bucket with it;" and from this expression it is sometimes called the Blue Bucket mine. The parties were too much pressed with hunger and thirst to stop and locate the mine. It must also be borne in mind that all this occurred in 1845, prior to the discovery of gold on this coast, and at that day people were not familiar with gold, either as dust or coin. From that day until this, wild tales of these mystical mines have been told, and many have been the expeditions which have been fitted out to refind this mine. In a Pendleton paper we see it announced that a few days ago a party started out sanguine of finding the mine.—*Oregon Courier.*

DURING the first seven months of the current year, the Daly mine of Utah had an output of 6316.16 ounces bullion, $295,110.70 of sulphides, and sales of ore which realized $78,273.90. Seven regular monthly dividends, of 25 cents per share each, making a total of $1.75 per share, were paid. The total dividends paid by the Daly to date are $1,575,000.

San Bernardino County.

Its Mineral and Other Resources.

NUMBER VII.

[Written for the PRESS by JAMES H. CROSSMAN.]

Sources of Water Supply.

There are only two important rivers flowing through San Bernardino county on the southerly and westerly slope of the San Bernardino range of mountains, and these are not navigable streams but very important sources of supply for irrigation purposes. The rivers referred to are the Santa Ana and the San Jacinto. There are, however, several large creeks, namely, Mill, Lythe, Warren and City creeks, from which immense quantities of water are taken for irrigating the rich but arid lands of the valley. The other streams that derive their supply from the San Bernardino mountains are the San Louis and San Diego, which, after flowing through and enriching the thirsty soil, discharge their waters into the Pacific ocean.

The desert region north of the San Bernardino range of mountains contains but few running streams. The principal, and in fact the only one of importance and note, is the

Mojave River.

It takes its rise in the San Bernardino range of mountains. Its principal fork is in Holcomb valley and flows northerly for a distance in an air-line of 75 miles from this point. It diverges and takes an easterly course, disappearing and sinking in Soda lake. From this point its waters flow in all probability through subterranean channels and discharge into the Pacific ocean either directly or via the Gulf of California. Its total length as a surface stream is about 200 miles, but it is eccentric to that extent that it is known as "The Hide and Seek River" of the Western continent. During the winter or flood season it forms a torrential stream of considerable capacity, in places overflowing large areas—in fact at this season of the year it carries such a volume of water that the late General John C. Fremont, in the employ of the United States Government in 1846 and 1847, reported to his superior in Washington that it was an inland navigable river (vide Congressional Reports). At its lowest stage in the summer season it carries a volume of not less than 10,000 inches miners' measurement. Its eccentricity consists in appearing and disappearing from view as a surface stream for considerable distances. On its course it disappears from sight several times, either absorbed by the sands, which have the carrying capacity of 22 per cent of water, as has repeatedly been proved by instrumental tests, or flowing through subterranean channels.

It flows as a surface stream from its source to a point 12 miles above Victor, when it sinks and continues invisible for a distance of 12 miles. At this point it comes to the surface, the granitic formation at "the gate" forming a bar to its further subterranean progress. Here it runs for a short distance forming a stream of that magnitude that it is unfordable during the flood season. Disappearing below the surface again, it is not seen for a distance of five miles. At a point above Oro Grande it reappears, having apparently lost none of its volume. Running for five miles, it reappears at a point above Cottonwood Station, and runs for one mile, then sinks and is invisible for a distance of 15 miles, rising at Barstow, where it is only seen for half a mile and disappears for six miles, coming to the surface at Fish Ponds, the site of the Silver Valley Land and Water Company's submerged dam to which I have previously made reference. From this point the water flows on the surface for a distance of one mile, sinks, and is not seen again until it reaches Hawley's Station, 12 miles distant, and flows here for half a mile and is not seen again until it reaches Camp Cady, where it comes to the surface and flows for one mile, then disappears from sight for 18 miles, rising at Cave Canyon. At this point a high ridge and narrow gorge occur similar to that at the "Victor gate" (this rim at one time evidently formed the rimrock of an extensive lake, the ridge standing at an elevation of 300 feet above the river-bed and only 200 feet in width). A dam could easily and cheaply be constructed here, forming a storage reservoir of great capacity overflowing a large area. Through this obstruction the Mojave river has cut its way.

The river now flows uninterruptedly as a surface stream for 10 miles with to all appearances its original volume, until it closes its career (except in extraordinary flood seasons) as a living stream by taking its final plunge into the desiccated and alkaline bed of Soda Lake. At periods of uncommon floods it rises to the surface at a point 20 miles distant and forms a junction with the Amargosa river; the united streams finally lose their waters in the south of Death Valley basin at a point near Saratoga Springs. Where the Mojave river comes to the surface the banks are covered by a dense growth of cottonwood and willow, and when cultivated produce large crops of grain, vegetables, fruit and alfalfa, evidences of the fertility of the soil.

The Amargosa River.

Though of minor importance in its volume and purity, its water being unfit for either agricultural or drinking purposes, this river has an important duty to perform. Its extreme length is 140 miles, commanding an extensive area of

tributary watershed. This river with its affluents courses through a section of the country in which the rocky formation contains an unusually large percentage of alkaline and saline mineral. The erosive action of the waters of the river and its tributaries on these friable and easily disintegrated rocks, with the assistance of atmospheric influences, rapidly destroys their integrity and dissolves the soluble minerals. The pure water of the river, under the powerful rays of the sun in this desiccated region, is segregated and evaporated, leaving the mineral product held in the form of a dense briny caustic solution; as the water decreases in volume evaporation is more rapid and the water becomes charged to its fullest capacity. To the eye of the thirsty traveler it is limpid and pure, but sure and certain death to the man or beast that partakes of it at this stage without remedial measures.

Death valley. From this creek the extensive refining works formerly belonging to W. P. Coleman obtain their supply of pure, fresh water for domestic and other purposes.

Springs.

In the desert region springs of considerable volume and strength occur, particularly in the vicinity of mountain ranges. Their sites were sedulously guarded and concealed from the white man's gaze by the aborigines of the desert—the Pinte Indians. To them they were the key to the citadel. Without water neither white nor red man could exist, and the springs were "few and far between." Drives of from 30 to 50 miles had to be made over burning sands to reach them, and if the traveler without trail or road missed his course and got lost, death was his portion. The Indians held them in greater esteem than silver or gold, but were induced to

side of Death valley at the base of Tom Wattles mountain and 18 miles west of the mouth of the Amargosa river, Tp. 22 N., R. 2 E., S. B. M.

Soda Lake, a dry lake, is situated in Tp. 12 N., R. 8 E. Though a dry lake, it has numerous springs of living water on its borders.

Paradise Springs, situated on the first range of mountains north of the Calico range, 20 miles north of Daggett, at an elevation of 2500 feet, Tp. 12 N., R. 1 E., S. B. M. These springs comprise a group, some of them hot, others cold, water pure.

Garlic Springs are situated on the Resting Spring road, Tp. 14 N., R. 3 E., S. B. M., where, for a distance of four miles, there occur numerous springs, the largest furnishing 18 inches of water, M. M.

Hot Springs lie on the east side of the Amargosa river, near McLane's ranch; temperature

At Chinese ranch on Clark's fork, six feet under the surface, water can be developed in sufficient quantities to run a smelting plant of any capacity.

New York mountain is well supplied with water from springs.

Pahrump valley, at an elevation of 3000 feet, 40 and 18 miles, in extent contains two springs 50 feet apart, the combined flow being 100 miners' inches.

Pahrump spring furnishes a regular flow of 800 inches miners' measurement.

29 Palms.

An important spring occurs in the vicinity of 29 Palms, from which flows a strong body of water. It gushes forth from the foot of a low mountain with considerable force. Its volume is sufficient to form quite a stream which flows for a distance of three miles and sinks in the

HEADGATE AND WASTEGATE OF KERN ISLAND CANAL, TAKING WATER FROM KERN RIVER.

The river has here performed its mission; it has served in a threefold capacity—first, as a disintegrator, second, as a carrier, and third, as a concentrator. Its remaining water is now drank up by the thirsty sands of the desert, leaving its mineral contents on the surface in a crystalline form ready for man's use. The alkaline, saline and borate beds in the region of Death Valley receive their supply from this and other sources, and so long as the sun shines and water runs this and similar regions will continue to produce their quota of these alkaline minerals.

The Amargosa river has its source in the State of Nevada about 30 miles easterly from the State Line gold mine on Gold mountain, and makes its first appearance as a river at the northerly end of the Oasis in Nye county, Nevada. Its general course is southerly until after passing through the Amargosa borax fields near Resting Springs through a deep canyon in the vicinity of the Salt Spring gold mine, where its course suddenly changes to almost due north, when it soon after sinks and disappears at a point near Saratoga Springs.

Furnace Creek

Takes its rise on the western slope of the southerly end of Grapevine Mountain in the Death Valley or Funeral Range of mountains, receiving its supply of about 200 miners' inches of water from a spring of pure cold water. It runs in a westerly direction for a distance of about three miles and sinks in the sands of

impart the secret of their hiding-place to a white man in whom they implicitly trusted by the name of John Mose. He in turn disclosed their whereabouts to members of his race, the prospectors and miners.

To the poor Indian of the Piute tribe is nearly extinct and the well-traveled trails of the white man have replaced the faint moccasin tracks made by the red man's feet. The desert is no longer a sealed book, but can be traveled with comparative safety at least in beaten tracks.

The forthcoming map, to which I have previously referred, will show the principal springs, and this serial article will serve as a text-book that will assist the desert traveler to find them.

Coyote Holes Spring is situated seven miles north of Hawley's station, on the southerly border of a dry lake; water saline and containing two per cent salt and one per cent borax, unfit for drinking purposes. It is in Tp. 11 N., R. 3 E., S. B. M. Thirty miles north of Daggett and on the western border of a dry lake is a spring in Tp. 14 N., R. 3 E., S. B. M.

Irawatz mountain, situated 70 miles northeast of Daggett, on south border of Death valley, contains numerous springs.

Cave Springs are 30 miles northwest of Garlic Springs, in a low gap in the Irawatz range, on the Resting wagon-road, two miles below the summit, on the north side, 13 miles from Tp. 9 N., R. 14 E., S. B. M.

Saratoga Springs are situated on the north

of water, 120° Fahr. It flows 337 miner's inches, and is celebrated for its medicinal qualities—severe chronic cases of inflammatory rheumatism have received permanent cures in brief periods.

Situated in the same vicinity flows thermal water of medicinal qualities, said to be a specific for certain diseases. There is also a cold spring in the vicinity flowing pure and drinkable water.

Oasis Springs form a marshy meadow of eight miles in length by one-fourth of a mile in width.

Ash meadows lie two miles east of the Amargosa river, on the Nevada State line, in which are several living springs of water.

The "Four Springs" occur in the range of mountains that extend along the eastern slope of the Death Valley basin at the base on the west of the range, distant from each other from one to three miles, one of them flowing from 250 to 400 inches of water, miner's measurement, and innumerable small ones that flow from one to 50 inches each. On the south end of the valley is a large spring the water so clear that at a depth of 70 feet small objects can be distinguished on its bottom.

Keane spring is one of considerable strength, 40 miles northeast of Ash Meadows.

Resting springs consists of six springs, flowing from 1 to 100 inches each, situated three miles east of the Amargosa river on the west slope of the Resting Spring range. Tp. 21 N. R. 8 E., S. B. M., 90 miles northeast of Daggett.

sands of the desert. This location is peculiarly adapted for a storage reservoir of great capacity.

The Head Works of a Kern County Canal.

Our engraving shows important parts of one of the leading irrigating canals of Kern county, and gives the distant reader a little idea of the work undertaken to make the waters of our streams available for pushing the large crops annually secured from irrigated lands.

This canal appropriates 20,000 inches of water, equivalent to 400 cubic feet per second. Its location dates back to 1870.

The headgate and wastegate of this canal are the main features in the engraving. The former was built in 1878, and its construction required 75,000 feet of lumber. It is shown on the left of the engraving, and the wastegate is on the right; both are 50 feet in width. The wastegate is made to open from the bottom with chains, in order to flush the sand away from the headgate, which admits the water to the canal. The water through the wastegate goes back into the river. The water is brought to the headgate by means of a wingdam, shown in the foreground of the picture, and the amount taken into the canal is regulated, of course, by the raising or lowering of the wastegate. The water goes into the canal over the gate boards, thus preventing the sand from entering the canal.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

NEW YORK MINE. — *Ledger*, Aug. 16: W. G. Andersnn of the New York mine, about 3½ miles southwest of Jackson, ioforms us that arrangements have been made for the erection of a 20-stamp mill on that claim, the contract for which has been let to the Hendy Works, San Francisco.

SUTTER CREEK.—Cor. Amador *Ledger*, Aug. 16: Improvements at the Wildman mine continue to be made. Since my last reference to this property, three circular saws have been added to the plaot—one for a crosscut, one for tenants and the third for making wedges. Each saw is run by an independent wheel of Knight & Co.'s patent, and these wheels are so perfectly bnxed that not a drop of water is seen to escape. In close proximity to the saw, a powerful derrick has beeo erected to facilitate the handling of heavy timbers, the capacity of which is one ton. A boom is attached, 50 feet long, commanding a space of 125 feet, which is also operated by water-power. This is used for piling logs to a hight of 20 feet if necessary, taking them off the loaded wagons and swinging them into place and to the crosscut saw as needed. This additional machinery alone, according to Mr. Tregloan's estimate, is a saving of the labor of ten men, and the outlay involved was about $1000. Grading for the additional ten stamps to the Wildman mill will be commenced in a few days. Knight & Co. are making 4000 feet of 15-inch douhle-riveted steel pipe to ruo the mill independently of the hoisting works, instead of runniog hoth by one pipe as heretofore. Sinking the shaft is progressing very favorably, averaging oine feet per week, besides doiog some repairiog in the shaft, and the eotire mill is kept running steadily. The Lincoln mill has been hung up for about two weeks, but was again started this week. The ledge is uncovered sufficiently to enable them to run for some time. Operations at the Rose mine came to a sudden standstill last week on account of coming in contact with bad air. Everything will remain idle until air-pipes can he put in. Sinking at the North Star is well-nigh completed, only 30 feet more remaining to complete the work. In two weeks more everything will he in readiness for drifting, and probably two drifts will be run at once, one east and the other west.

El Dorado.

NEW STAMPS.—*Mountain Democrat*, Aug. 16: The five new stamps on the Gentle Annie mine, on Poverty Poiot, have been put in operatioo, and now ten stamps are pounding away on good rock from the claim. A new tunoel has been started on the north end of the mine, and a new track laid from that point to the mill. An increased force is now at work, and the mine is booming aloog in a manner very satisfactory to the owners.

Fresno.

MINARET IRON MINES. — Fresno *Republican*, Aug. 15: P. B. Donahoo, Peter Hanson, John Hanson, W. S. Nelson, J. Robinson, M. Deneke and C. Beck have returoed from a trip to the Minaret iron mines, which they visited for the purpose of determining the exteot of the deposit. The ledge stands up in one place as a perpeodicular wall 1500 feet high and extends along the mountains for a distance of between one and two miles, having ao average width of 300 feet. The ore is as rich as that of the richest iron mines in the world, assaying 67 per eent of iron. It will make a fine quality of steel, but owing to a trifling excess of phosphorus it cannot be used for Bessemer iron. There is an abundance of water-power near the mine and also of wood for fuel, and smelting works could he maintained there at comparatively small expense. But it cannot he developed without a railroad conoecting it with Fresoo. The gentlemen interested in the mines say that a railroad can be constructed with an easy grade along the San Joaquin river to its headwaters without getting into the snow helt.

Inyo.

THE SALE MADE.—*Register*, Aug. 14: Messrs. Turner and Sanboro, the purchasers of the Kincaid mines at Sylvania, and W. F. Kincaid were in town this morniog. While here they acknowledged, before Notary Forhes, the fioal deed to the mines upon which, to a large extent, depend local hopes. The purchase-money, $15,000, bas heen paid over, and Messrs. Turner, Sanborn and Fife now enter into full possession of the Sylvania property. This means that the mines will be developed if coin will do it. The ore, by the way, is improving in quality with the depth of the shaft.

FISH SPRINGS.—*Register*, Aug. 14: From Henry Melone we learn that the Fish Spriogs mines, five miles south of Big Pine, are paying. The Melone & Fuller mine, koown as the Yellow Gnat, is getting into shape to pay more than expenses. The shaft is down 100 feet. From the bottom two drifts are run, one 40, the other 50 feet. A tunoel, 140 feet, cuts the ledge 225 feet from the surface, therefore, 125 feet below the bottom of the shaft. Last week seven tons of ore were run through the arastra and yielded $53 per ton. The tailings were afterward sold for $5 a 100, so the ore is of first-rate quality.

AN OLD CLAIM.—Tradition, at least, says that 25 or 30 years ago an old Freochman mined well and successfully at some point across here to the eastward in the White mountains. With a small arastra he got out enough gold to carry him back to Fraoce. In this view he told his countrymen of his mine, upon which a company was orgaoized and a party sent here to find and work it. In the meantime the big earthquake of '72 had beeo here and so banged things around in that vicioity as to cover up every trace of the old workings, and the party gave up the search and went home. And now comes Nathaniel Williams, who has been working over here in the Inyos, aod says that he has at last found the workings, though they were covered up by the earthquake. If the claim paid so well in those days, it ought to prove a big bonanza in these days.

REDDING CANYON.—Messrs. Hill, Anderson & Williams, owners of the Enterprise and Georgia mines io Redding canyon, have let a contract to Geo. F. Willis to run a 30-foot drift in the Enterprise. These prospects are likely to become paying and valuahle properties, assays and indications all favoring the existence of a big ledge in the immediate vicinity. Water and wood are at hand, the former in quantity sufficient to run a small mill or arastra The mines are half-way up to the summit of the White Mountains, four or five miles from the railroad track and eight or nine miles from town.

Mono.

BODIE.—*Alta*, Aug. 21: The west crosscut from top of upraise from south drift, 700 level, was extended 5 feet. North drift from joint crosscut, 700 level, was extended 13 feet. East crosscut from main north drift, 700 level, was extended 6 feet. West crosscut from same drift was extended 24 feet.

MONO.—The south drift from joint crosscut, 700 level, was extended 8 feet.

BULWER.—The south drift from No. 1 west crosscut, 400 level, was extended 27 feet. Started upraise from same drift and extended it 12 feet. Upraise from south drift, Bulwer tunnel level, was extended 5 feet.

Monterey.

LOS BURROS DISTRICT.—Salinas *Democrat*, Aug. 6: Joseph McArthur of Mansfield, Los Burros, stopped over in Salinas Tuesday on his way home from San Francisco, where he had been for a few weeks forming a company to operate a copper mine in the Los Burros district, this county, in which work he succeeded. The mine will be opened immediately uoon his return, and all the necessary tools, powder, etc., have been shipped by rail to King City, from which point it will be traosported to the mine. The ledge has already been prospected to a depth of 30 feet, at which point it is 40 feet wide. From an assay of ore taken to the city, it showed pure copper from 12 to 45 per cent, $6 in gold and 4 ounces of silver to the ton. The location of the mine is about 8 miles south of Mansfield aod about 1½ miles east of the Pacific ocean. Pure copper has a commercial value of 17 to 18 cents per pound, and at 12 cents per pound the product of this mine with a 10-ton smelter would produce 4500 pounds io 24 hours of a total value of $540, netting the company $415 per day. We are also informed by Mr. McArthur that Wm. Cruikshank has discovered a very rich quicksilver ledge, about 4½ miles south of Mansfield and two miles from the ocean. The ledge is between three and four feet wide on top and is very rich in quicksilver. A tunnel is now io 125 feet, and it is expected that the ledge will be tapped at 150 feet. Mr. McArthur is also the discoverer of a manganese deposit from which 40 toos have heeo taken and are now on the dump. The deposit ranges on the surface from 4 to 10 feet wide, and over 150 toos are cropping out. The product of this deposit is pronounced as of the finest quality. The Grizzly mine in Los Burros has recently made its second shipment, within six weeks, to San Francisco, the amount being $2000. As the water has given out, arrangements have been made by this company to mill its ore at the Cruikshank works.

Nevada.

WILL MAKE A MINE.—*Tidings*, Aug. 16: For three months past the W. Y. O. D. mine has been paying its way, although sinking and drifting have been steadily pushed aod but little stoping done. The ledge in the drifts at the 600-foot level is of good size, showing gold and considerable sulphurets, and the country ground is favorable. In the shaft which is being put down for the 700-foot level, the vein is as strong and of as good quality as in the drifts, affording every indication of permanency. The force of miners is to be considerahly increased shortly, when the stockholders may expect to receive the reward so richly merited by reasoo of the confidence aod persistence shown. The management is highly elated over the outlook. The annual meeting was held Friday evening and the followiog stockholders elected directors for the eosuing year: E. J. Brockington, president; W. J. Connors, vice-president; Joseph Weissbein, secretary; Jacob Weissbein, treasurer; and C. A. Brockington. The last-oamed gentleman was re-elected superintendent.

A RICH BOWLDER.—Grass Valley *Union*, Aug. 17: A few days ago, while workiog in his gravel claim at Dutch Flat, Jeff Doolittle found a bowlder of quartz character, heavily laden with gold. The bowlder weighed 11 tons and has been hrokeo up, and for the past few days teams have been eugaged in hauling it to Nevada City where it has been put through mill process. The yield is about $150 per ton. How many more of just such pieces are lying around in all our gravel mines.

THE COE MINE.—Grass Valley *Union*, Aug. 18: Arrangements have been fully made to open up and work the Coe mine. The Grass Valley Queeo Gold Mining Co., an incorporation, has undertaken to work on the Coe, and the same incorporation will probably work other mines in this district. The work of pumping out the Coe will begio to-morrow, under the foremanship of James Hammill, ooe of our most experienced miners, and a mao of the best kind of hard practical mioing sense. Mr. Robert Stevenson represents the Grass Valley Queen Co.

HOLBROOKE AND HARRINGTON GRAVEL MINE Grass Valley *Union*, Aug. 18: This is the name by which the Webster gravel mine at Randolph Flat is now known and upoo which work has been resumed after the mine has lain idle since the year 1871. The enterprise is heing conducted by Mrs. E. E. Holbrooke of this place, who, satisfied of the value of the ground, which produced over $50,000 duriog the former working, decided some months ago to put up steam hoisting works aod sink a new incline shaft on the gravel channel some distance from the old shaft. Ground was hroken on the new location on the 20th of July, and since that date a road has been constructed to the site, a boarding-house for the workmen built, a hoisting and pumping works erected, and the incline sunk to. a depth of 45 feet. The hoisting works are 36 by 70 feet in dimeosions, and 20 feet in hight, the secood story being used as the landing floor for the cars. The engioe is a 9½-inch cylinder with 12-inch stroke, aod all the hoisting and pumping gear is compact and strong, and all the woodwork about the machinery is solid and substantial. The incline shaft that is beiog sunk is 8 feet by 5 feet 4 inches, with two compartments—one for pumping, the other for hoisting. Night and day shifts are engaged in sinking the incline, which near the surface is through cemented ground mixed with bowlders and gravel. The shaft is on an inclination of 75 degrees and will be in vertical depth 120 feet, or on the incline 170 feet to the bottom of the channel, which is ascertained from the former workings. The shaft is now being sunk and timbered at the rate of five feet per day. Mrs. Holbrooke deserves great credit for her energy and pluck in opening up the mine after it has been so long idle, and from all reports it looks as though she would meet with the reward she deserves.

Placer.

THE KIRKLAND MINE.—*Herald*, Aug. 16: The German company that recently bonded the Kirkland mine near Ophir—an extension of the now famous Hathaway—are working eight men in sinking on the ledge with the view of better developing its character. They are now down about 150 feet, and at the bottom of the shaft the ledge is about three feet thick and the character of the ore is very favorable. Fraok Brannon, late of Alaska, is superiotending the work.

Plumas.

THE ALTOONA MINE.—Greenville *Bulletin*, Aug. 17: Early in the week, in company with the owoer, we had the pleasure of visiting this mine. It is located near the top of the mountain above the Green Mountain mining property, of which it appears to be a continuation. Judge Emmons has owoed it several years, but had not the means to develop the property. Last year, however, he pushed a tuonel in on a large vein of quartz, which he took out aod crushed, hauling it a long distance to a mill for that purpose. The returns were satisfactory. Two miners—Mr. Cavanaugh aod Mr. Potts—are now at work driving the tunnel ahead. In the face of the drift the vein of quartz is eight feet wide. It is fine-looking and prospects well. This development is of much importance. It can be reached at great depth quite easily through the Green Mountain tunoel, and through it could be mined and milled very cheaply. The ledge is betweeo well-defined walls standing at an angle of about 45 degrees.

Shasta.

OLD DIGGINGS DISTRICT.—Cor. Redding *Free Press*, Aug. 16: Messrs. Whitehouse and Bliss of New York have decided to develop the Central mine at once and will go to work as soon as arrangements can be perfected. Mr. Champion bought another large mine—the Trinity, on Dog creek. He expects to go to work soon and develop one of the finest properties in the State. Walker Bros. made a good cleanup on the 1st inst, and shipped a carload of concentrates to the Butters Ore Milling Works at Kennet the same day. Hart & Fleming shipped a carload to the Selby Smelting Works Aug. 9th. Twenty-two mining men, experts and capitalists, in Redding one day last week. Mr. Hart has gone to San Francisco to "railroad" a U. S. patent through for the Texas and Georgia mines. A sale of this valuable property to the Sierra Buttes Co. is practically complete. We uoderstand that a price has been agreed upon and all that is needed is a title; the purchasers being aliens cannot get a U. S. patent. This shows the importance of securing patents for mining claims. It appears that the big scheme spoken of by the *Free Press* is about to materialize.

MINES PURCHASED.—Redding *Free Press*, Aug. 16: On the 9th inst. the Gladstone group of mines was purchased by the Bimetallic Mining Company of Montana. We are not informed of the purchase price. It is encouraging to the French Gulch people to go ahead developing mines, when a solid and successful company like the Bimetallic comes in and pays a big cash sum with much preliminary examination of the property. These mines are said to be an exception, having beeo dividend payers under the adverse circumstances of having a patent quartz-mill to work the ore instead of a standard battery.

Sierra.

PIKE CITY.—*Mountain Messenger*, Aug. 6: We are informed by J. H. Ryan of Pike City that there is a good prospect of a big boom in mining at that town, average ore yielding $12.84 a ton from the surface vein, having been taken out of the Grizzly ledge opposite the Alaska quartz-mill. The property is owned by Miles I'Ansen of Newark, N. J. Mioing capitalists from San Francisco are coming to Pike City to look at the merits of the Alaska quartz ledge, having failed to find a mioe that suited them in Grass Valley.

THE SIERRA BUTTES MINE.—Sierra *Tribune*, Aug. 16: The Grass Valley *Tidings* is wrong in stating that the Sierra Buttes is to be dismantled or, in other words, abandoned. It is too late in the season to do much now, but next year the 20-stamp mill at No. 7 will be rehuilt and it will be erected io a place where snowslides will not be likely to reach it. In addition to taking out ore enough to keep the mill going, there will be prospecting going on, and perhaps the future history of this mine will figure something after the Plumas Eureka, which mine, our readers will remember, went dowo to a very low ebb a few years ago. In fact, operations were about to he suspended there, but a little further prospecting was done, a new body of ore was opened up and the mine to-day is paying handsome dividends. The Sierra Buttes is a big mountain and the mine named after it has heen a big institution, too, but there is no reason to suppose that the great hill has yet delivered up all its riches.

A BIG MINING ENTERPRISE.—Three miles southwest from the Mountain House the Golden Giant drift mining company is operating. They have run a tunnel 1200 feet into the mountain aod are now engaged in putting in a Burleigh drill. As soon as the drill is got in working order the tunnel will he pushed ahead to the channel, which, it is figured upon, will be reached in 600 feet farther. The drill machioery was purchased from A. C. Busch of this place, who is also one of the owners in this enterprise. John Gale of the Mountain House and several Downieville parties compose the balance of the company.

THE MOUNTAIN MINE.—The road leading up to the Mountaio mine, for which Hagerty & Flint have the contract to build, will be completed inside of three or four days. Work on the tramway is beiog pushed ahead as rapidly as possible and the contractor expects to have it running in three or four weeks. The mill is covered and the battery blocks are being placed in position. The mill will be ready to start up by the time the tramway is completed.

THE ORDER OF THINGS REVERSED.—The ore coming out of the stope on the west drift of the No. 17 level of the North Star mine at Grass Valley cootinues to be of extraordinary richness. Some newspaper down there said that the floor of the office was literally paved with gold. That reverses the order of things. Generally the gold is used to line the pockets of the office-holders.

ADDITIONAL STAMPS.—Three additional stamps have heen ordered from the Downieville foundry for the mill at the Wm. Tell mine. The present three stamps are pounding away regularly and the plates are showing up in fine shape. Mark the *Tribune's* prophecy: The Wm. Tell is going to develop into one of the big mines of California.

A GOOD PROSPECT.—Up at the Mexican ledge, located above the Wm. Tell mine and owned by Tony Grass and Caspar Joos, a shaft is being sunk, and lately a good-looking vein of four or five feet in width was encountered. That seems to he a good neighhorhnod for quartz ledges.

PROSPECTING.—A. L. Moore aod Messrs. Taylor & Thomas, the surveyors, are running a tunnel on their quartz ledge near the Phœnix mine.

San Diego.

AT BANNER.—Julian *Sentinel*, Aug. 16: J. R. Pollard was up from the Banner the first of the week. He informs us that he has obtained a third interest in the "76" mine and will go to wnrk on it at once.

Tuolumne.

PLATT & GILSON.—Tuolumne *Independent*, Aug. 16: Mr. C. Hermann of San Francisco has been in town the past week paying off the iodebtedness of the Platt & Gilson mine, of which Mr. H. is the principal owner. We understand that the mine is now unincumhered, and that operatioos have been commenced. Supt. Tritenhach has resumed charge. We are informed that the old company has been disbanded, a new company formed, and the stock divided into 30 shares.

MINING SUIT.—The McCormick Bros. have commenced a suit against the Sanguissipi Mining Co. Accordiog to the survey lines, they claim the mine is on their ground. The mill has been shut down, but the contractors are still sinking the shaft.

NEVADA.

Washoe District.

GOULD & CURRY.—Virginia *Enterprise*, Aug. 16: On the 625 level the south drift has been cleaned out and repaired 30 feet; total distance 170 feet.

BEST & BELCHER.—On the 1200 level at a point in the north drift, 525 feet from the south line, upraise No. 1 has been started and carried up a distance of 10 feet. Formation, porphyry.

ALTA.—About 300 tons of ore of the average value of $21.50 per ton, as per battery samples, were crushed the past week. Driftiog northwest of the shaft in ore of fair milling grade on the 1000 level. The 825 and 925 level stopes are yieldiog as usual and looking well.

OCCIDENTAL.—Extracting fair grade ore from the stopes oo the 400 and 450 levels. The winze from the west crosscut on the north line, 550 level, is down 98 feet, the bottom being in quartz and porphyry showing some value.

UTAH.—The main south drift has beeo extended 57 feet; total length, 300 feet. The formation passed through is vein porphyry, clay aod quartz—the latter showing a little value.

ANDES.—On the 420 level a north drift started from No. 1 crosscut is out 67 feet—face in low-grade quartz.

HALE & NORCROSS.—On the 900 level the upraise was advanced 21 feet, making its total hight 45 feet. This upraise is in fair-grade ore.

SAVAGE.—Are extracting ore from the 400, 500, 600, 750 and 1300 levels. Milled during the week 455 tons of ore; average battery assays, $20.50 per ton. Bullion on hand and at the mill, $9059.

YELLOW JACKET.—Prospecting on the 500 and 800 levels being prosecuted with eoergy. Machinery workiog splendidly. Shipping to the Brunswick mill 80 tons of ore daily of the average assay value, as per battery samples, of $21 per ton.

CROWN POINT.—The 300 east stope is looking and yielding about the same as last week. A considerable amount of rock is still coming from the 300 west stope and is composed chiefly of old fillings. Shipped to the mill during the week 775 tons 640 pounds of ore, the average battery assay of which was $16.

BEST & BELCHER.—The 200 north drift from the west crosscut advanced 13 feet during the week, making its length 192 feet. The face is in a mixture of clay and porphyry and streaks of quartz. Have opened the 1000 stope oine sets long by two wide. Will raise the second floor shortly. The 300 stope is up 10 floors from where it was started, and looks well in the top. Shipped to the Vivian mill during the week 274 tons and 630 pounds of ore, the average assay of which was $22 97 per ton.

SEG. BELCHER AND MIDES.—The joint 1300 winze is down 67 feet, having been sunk 19 feet during the week. The bottom is in low-grade quartz and porphyry.

CHALLENGE AND CONFIDENCE.—The joint Confidence, Challenge and Imperial west crosscut No. 2, 1000 level, is out 338 feet, 25 feet having heen made during the week, the face showing quartz having no value. The joint Coofidence, Challeoge and Imperial north lateral drift, same level, is in 520 feet, 33 feet having been made, the face in porphyry.

JUSTICE.—Shipped to the mill during the week 163 toos and 1440 pounds of ore, the average battery assay of which was $31.73 per ton.

IMPERIAL CON.—The joint Confidence, Challenge and Imperial west crosscut No. 2, 1000 level, is out 333 feet, 25 feet having been made, the face in valueless quartz. The west crosscut No. 1, 1000 level, is out 263 feet, having been advanced 23 feet during the week, the face showing porphyry.

OVERMAN.—Extracted and hoisted from the 1300 level 380 toos and 800 pounds of ore. Car sample assays average $19.88 per ton. Shipped to the Brunswick mill 432 toos of ore. Battery samples average $15.88 per ton. Oo Aug. 3d shipped two bars of hullioo; value $9820.06, making total shipments for July account $38,353.64. Amount of ore worked in July 2500 tons. Gross amount of bullion returoed for same, $38,474.43.

CHOLLAR.—Have extracted and sent to the Nevada mill during the past week 426 tons of ore, the battery assay of which averaged $22.72 a ton.

POTOSI.—The south drift from the 1030 winze station is out 140 feet; face in quartz and porphyry. The winze below the 930 level is down 330 feet oo the slope. The bottom is in porphyry with streaks of quartz through it giving fair assays.

WARD COMBINATION SHAFT.—East drift from the 1800 station is now out 482 feet. 10 feet having heen made the past week; face in hard porphyry.

EXCHEQUER.—Work in east crosscut, 150 feet south of the north line, 500 level, is still undergoing repairs. The north lateral drift, 600 level, is out 418 feet; face in porphyry and small streaks of quartz.

ALPHA.—East crosscut No. 2, 600 level, is out

130 feet; face in quartz and porphyry. Southwest crosscut, 600 level, is out 150 feet; face in porphyry with small streaks of quartz through it.

SILVER HILL.—The southeast drift on the 260 level, 240 feet from the shaft, is out 75 feet; face in quartz and porphyry. The northwest drift, 334 level, advanced 20 feet; total distance from shaft, 330 feet; face in hard porphyry.

NEW YORK.—North lateral drift, 800 level, from No. 1 west crosscut, is out 351 feet, face in clay and porphyry. The north drift, 655 level, is out 27 feet; face in porphyry. North drift, 1100 level, is out north of shaft 95 feet; face in quartz and porphyry.

Eureka District.

ORE SHIPMENTS.—Eureka *Sentinel*, Aug. 16: During the week the Eureka & Palisade railroad shipped 165 tons of ore to the Salt Lake City smelters.

Safford District.

THE ONONDAGA.—Eureka *Sentinel*, Aug. 16: The *Sentinel* hears on good authority that matters are soon to be put in operation again in the Ononda ga mine in Safford district, near Palisade. A representative of the company is to be up this week to pay off all the back bills, and it is said that the company will resume under more favorable auspices than it has hitherto known. We hope that there will be no disappointment about it. There are good mines at Safford, and that district is sure to give a good account of itself when the proper effort and capital are expended there.

Tuecarora District.

DEL MONTE.—*Times-Review*, Aug. 15: Very little work has been done during the week, as miners have been scarce, but will resume work at all the different points within a few days.

NEVADA QUEEN.—Raise from the 600-foot level of the North Belle Isle has reached the 500-foot level and a crosscut is being run for the drift and will connect in two or three days.

NAVAJO.—The stopes above the 150-foot level continue to produce the usual quantity of high-grade ore. North drift from No. 1 crosscut south of the shaft, 250-foot level, extended 20 feet. The face is getting harder and shows some low-grade ore.

BELLE ISLE.—South intermediate drift from No. 1 upraise above the 350-foot level, has been extended eight feet alongside of the ledge, which shows good and strong with some concentrating ore making in the hanging-wall. Arrangements for pumping out the 450-foot level are completed and the pumps start to-morrow.

NORTH BELLE ISLE.—The stopes are looking and yielding better. The concentrator is doing very good work, the jig tailings for the week averaging but 75 cents.

NORTH COMMONWEALTH.—Stopes continue to yield about same amount. Have sent to the mill 100 tons, assay value $242 per ton; hoisted and shipped to concentrator 400 tons. Union mill is doing good work on the company's ore.

COMMONWEALTH.—First level—Joint east crosscut extended 17 feet, passing through a vein seven feet wide giving low assays. Have started drifting north on the vein, in seven feet. No. 1 raise from joint west crosscut has been carried up 16 feet. Intermediate drift from No. 6 chute extended 12 feet, exposing two feet of ore, half of it being $234 ore, car sample.

MINERS BUSY.—*Central Nevadan*, Aug. 16: About 300 men are employed in the mines of Tuscarora, and every miner who comes along is set to work. The combination of mines, store, gin-mill and store has been done away with by the new management. This will make Tuscarora a better business place and give the company employes the freedom of spending their hard-earned cash wherever their tastes are best suited.

ARIZONA.

ORE SHIPPED.—Prescott *Courier*, Aug. 16: Steve Mott recently shipped a carload of ore worth between $4000 and $5000; is shipping another carload of richer ore and has the Tuscumbia mill almost ready to run. The Etta mine, near Verde, is opening up well. Reserves of ore are large. It will have a new mill shortly. Dell Thorne's teams arrived here recently with gold sulphurets from the Congress. The gold ledge that was found a short time ago near Iron Springs is said to look very promising. Lots of placer gold have been coming in pretty regularly since the rains made water for rocking and sluicing. Experts have examined the onyx property in Big Bug district and may buy it.

IDAHO.

BLACKFOOT.—Cor. Salt *Tribune*, Aug. 17: The Triumph mine, located a few miles south of Nicholia, on the Little Lost river side of the range there, is showing up finely. This is a low-grade property, almost identical in quality of ore to the Viola mine at Nicholia, which has sent out so much bullion. The Triumph Co. is simply developing to open up a mine large enough to warrant the erection of a smelter. The carbonate and galena ore lies in pockets or blanket deposits from a few inches to 8 feet thick, and like the Viola, may open out a half hundred in places. The ore averages over 50 per cent lead and 10 or 12 ounces silver. It is being developed by tunnels and drifts, in which some 500 or 600 tons of ore has been piled on the dump, and some 5000 or 6000 tons has been exposed by cuttings. A tunnel 200 feet long cuts 100 feet below the known ore bodies, and these will be reached by upraises.

MONTANA.

THE LION.—*New Northwest*, Aug. 16: The Lion shaft was down 291 feet on Sunday last, and it is over 300 feet to-day. The sump will still have to be sunk a few feet and a station put in, occupying perhaps a week, when crosscutting will commence. The vein was struck in the shaft this week, but has not been crosscut. Water has been coming in very strong recently from the north, where the vein is located.

THE PHŒNIX.—The Phœnix Co.'s property is coming to the front as one of the best in Oro Fino district. On Wednesday the miners uncovered as rich a body of ore in the east drift of the 200-foot level as has ever been shown up in the camp. Specimens of ore shown us are estimated as carrying 2000 or 3000 ounces silver. The full extent of the strike is not known as yet. It is safe to say, however, that at a depth of 200 feet there has been nothing to equal it in the district, it being generally conceded that with the amount of work done (225 feet of shaft, 40 feet of crosscuts and 35 feet of levels run) the Phœnix stands at least near if not at the head of the list.

GOLDEN CHARIOT.—Phillipsburg *Mail*, Aug. 16: Joe Thom has lately made a rich strike on the Golden Chariot, which is located on the east side of Dunkleberg creek. The vein is about three feet wide and contains nice-looking ore. A couple of assays were made from samples from the lead, the first-class running from 80 to 100 ounces in silver, and the second-class from 42 to 48 ounces. The ore, as is the case with most all that of Dunkleberg, contains a large per cent of lead and is consequently in demand at the various smelters. The strike had not been made many days before the property had been leased and bonded to the Great Falls Co. Messrs. Scott and J. A. Featherman made the arrangements for the company. The rock is said to be a green chloride and yellow carbonate and the formation is slate.

NEW MEXICO.

COPPER.—Silver City *Enterprise*, Aug. 16: Two carloads of copper ore were shipped from the Hidden Treasure mine at Hanover since last Saturday. Careful sampling shows the mineral to contain 40 per cent of pure copper.

IRON.—Scattered along the crest of the southeast spur of Legal Tender Hill there are 7000 tons of iron ore stacked up awaiting shipment to Socorro and El Paso as fluxing material for the smelting establishments located at the points mentioned.

PACIFIC GOLD.—Reliable information is to the effect that the Pacific G. M. Co. has leased its property to J. C. Carero, a noted mining expert, who for a long time past has been in charge of the Bennett mine in the Organ mountains. This is one of the most noted properties in Pinos Altos district.

LONE MOUNTAIN.—Reports from Lone Mountain are very encouraging to the mine-owners as well as the prospectors. The Mammoth, one of the old reliable standbys, continues to yield its precious metals as of old. The management under the immediate supervision of Frank Bisbee, a large owner in the property, has been very successful; the next shipment to be made in a few days will run considerably over $2000.

CENTRAL.—Lindaur & Woods of Central have had a run of 12 tons of ore from the St. Helena mine in the Wagner mill at Pinos Altos, by Stanley & McDonald. The ore ran at the rate of an ounce per ton; the concentrates, of which 600 pounds was obtained from the run, are valued at $200 per ton.

GEORGETOWN.—The richest ore ever found in the mines is now being taken out of the deep workings on the Scottish Chief ground. The long prospecting incline has been run up to the "Dyke," so plainly discernible on the surface, and as foreshadowed, the strike is of unusual richness.

MANGAS.—The newly organized company are proceeding slowly but nevertheless surely in the development of their property. The workings now approximate 90 feet in depth.

OREGON.

THE SANTIAM MINES. — Albany *Disseminator*, Aug. 16: In 1860 gold was first discovered at Quartzville and some machinery taken in. The works were eventually abandoned, however, and nothing more was done for a number of years. Recently prospectors were sent up from this city and the remarkably fine specimens brought out by them induced capitalists here to form a stock company for the further development of the mines. A company was formed and the stock was soon all taken. Claims were located and for the past 12 months have been worked, the results being entirely satisfactory. Last week the richest leads yet found were discovered. It has been said that there has been prospected an area of 300 acres, upon any point of which a pan of dirt taken will yield from 3 to 10 cents. Experienced miners have examined the ore and pronounced it equal to any ever taken from the great mines of Colorado, Idaho or California. The mines are within a few miles of the Oregon Pacific railroad, and it is only a question of time, and a very short time, when a branch of this line will bring the mines in direct communication with Albany. A steam engine and a five-stamp mill have been taken into the mines and will be in operation next month.

UTAH.

PROSPECTORS.—Eureka *Chief*, Aug. 17: The Northern Spy region is alive with prospectors, and new discoveries will probably be made there soon. Rumor has it that an immense body of ore, rich in native silver, has been discovered on the 400-foot level of the Keystone, several hundred feet north from the shaft. Chas. D. Nelson has a shaft down 23 feet on the Alabama, two miles north of town, and is also doing work on the Shamrock, in the same vicinity, which is looking way up. Work is being pushed on the Seneca group, the property of J. H. and J. P. Driscoll and P. J. Harrington, northwest of town. They have the shaft down 70 feet. The indications are excellent. Will Morris and Tom Jackson went over to the Mount Nebo district the first of the week and located a claim for themselves, Will Kehler and A. Burch. They say they have shipping ore on the surface. J. D. Kendall, manager of the Centennial-Eureka, went to Provo Wednesday to make arrangements to have an electric light plant put in at that mine.

PARK NOTES.—Salt Lake *Tribune*, Aug. 17: The Crescent Mining Co. shipped during the past week 398,500 lbs. of concentrates. J. M. Richardson, Crescent leaser, made a shipment this week of 47,840 lbs. of first-class ore. The Northland-Nevada leasers are again in the field as ore shippers, having sent off this week 53 tons of good ore. Received at Park City Sampler for the week ending Aug. 15th: 527,720 lbs. of Ontario ore; 91,630 lbs. of Daly ore; 106,260 lbs. of Northland-Nevada ore; 238,480 lbs. of Anchor concentrates; 62,340 lbs. of Mayflower concentrates. The Anchor, Woodside, Alliance, Alliance Tunnel and Northland-Nevada paid off this week. The Ontario Drain Tunnel is in a distance of over a mile, and the work is progressing freely. The formation recently changed from porphyry to lime. Although a large number of prospects are being worked at present there is but very little mining news to communicate.

Mining Share Market.

The mining share market has see-sawed the past week, greatly to the disgust of both the bulls and bears—neither side being able to make much of a turn. The news from some of the mines is of a most flattering character, which, combined with an advance in silver, ought to send the stock market well up, but it is the stealings that are going on in some of if not in all of the mines that destroy confidence and neutralize the favorable conditions. It is this lack of confidence that makes it difficult for the ring to make much of a deal—the trading public appears to be too well educated not to unload their holdings or else sell short on every small up move. Yet even with this drawback we still believe in an up move. This opinion is grounded upon the well-established fact that the ring has been forced to buy considerable stocks which they evidently want to sell at a profit, and to do so they will by their system of cross orders advance prices so as to draw in buyers if they can. The ring may even make better reports, higher assays, etc., to bring in a new class of buyers so as to unload at a profit, after which the old, old story.

In outside stocks, the market has been quiet at shading prices for the Tuscaroras and Quijotoas. In the Bodies, Bodie has shown more activity; usually well-informed parties look for a sharp break soon.

According to the sworn statement of the superintendent of the Consolidated California and Virginia mine, there are 207 miners at work in the mine as follows: 96 in the C. & C., 79 Con. Virginia and 32 Ophir. A Comstock miner informs us that the 96 are working from the 1600 level down, the 79 above that level, but the 32 he cannot place, unless they are stoping out ore from the Ophir mine, but then the Con. Virginia Company has them hired. Another miner says they are doing secretive joint-work.

A correspondent asks if the mill ring does not see the handwriting on the wall: "Mene mene Tekel, Upharsin." Thou art weighed in the balance and found wanting.

Reliable private news from the Comstock mines continues hard to get. There are all kinds of rumors afloat, but when sifted they are not deserving of credit. Official advices report more activity and a brighter outlook for the Gold Hill mines since the 800-foot level Yellow Jacket north drift has made connection with the Con. Imperial shaft, but whether outside stockholders will be benefited is an open question. This connection gives ventilation and opens up a wide area for active prospecting, for which purpose more miners are to be put to work. Crown Point's battery assays are now below $15 a ton, Overman's and Belcher's are slightly lower. There is active prospecting in the latter mine. The superintendent of Kentuck reports an improvement on the 1000-foot level both east and west, with more mineral quartz coming. In the east drift it is white quartz; it goes $9.59 in gold and $1.80 in silver. In Savage the official letter reports the ore 24 feet wide, which they are now hoisting to mill. As the ore goes over $40 a ton, the battery assays ought to be about $30 a ton. In Hale and Norcross the prospecting work is more encouraging. In sinking the winze in Ophir they ran into old workings, which, it is said, they have since passed through. The outlook is said to be encouraging when they drift west. There are mysterious hints about Con. Virginia, Best and Belcher and Sierra Nevada. In Potosi and Bullion the work now going on ought to make itself felt soon in the stock market.

Everette's Mining Office.

The Everette mining office and assay chemical laboratory, located at Tacoma, Washington, is one of the best equipped offices on the Pacific Coast. The laboratory is commodious and contains from 4000 to 5000 specimens, the product of mines all over the world. A very interesting exhibit is made of the specimens from Western mines, and especially those of the coast. Dr. Everette has a very extensive library containing 400 of the best works on chemistry, assaying, mining law, mineralogy and geology. There are crucibles, scorifiers and other assaying apparatus of the best designs. Here is also one of the largest stocks of chemicals found in the Northwest. At one end of the laboratory is a battery of four blast furnaces for assaying and smelting. Here is also a pyrometer for nace where the fusing points of substances can be ascertained. Then comes a large crucible furnace—probably the largest on the coast. Dr. Everetto informs us that all mining men and investment-seekers are invited to visit his office, where he will give any legitimate information regarding the mineral resources of any district.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Modoc and Lassen Cos.
T. M. STACKUS—Sierra Co.
J. W. PURDY—Sonora, Cal.
GEO. WILSON—Sacramento Co.
FRANK S. CHAPIN—Lake Co.
J. C. HOAG—San Francisco.
J. G. H. LAMPADIUS—Santa Cruz and San Benito Cos.
SAMUEL CLIFF—San Luis Obispo Co.
W. W. THROBALDS—Orange and San Diego Cos.
C. J. WADE—San Bernardino Co.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
E. B. TAFT—Tulare Co.
W. B. FROST—Merced Co.
E. H. SCHAEFFLE—Calaveras Co.
T. B. DAPRAY—San Francisco.
O. N. CADWELL, Carpinteria, Cal.
WM. M. HILLEARY—Oregon.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.
E. E. DEMING—Ashland, Oregon.
L. CASS BROWN—Oregon and Washington.
R. G. BAILEY—Washington.

SAN DIEGO is now getting its coal from Puget Sound instead of Newcastle. A line of steamers will be established carrying coal down the coast and fruit and grain back.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUG. 12, 1890.

434,074.—MAT FOR FERMENTING VATS—C. Bazus, S. F.

434,142.—CONDUCTOR'S PUNCH—A. W. Coffin, S. F.

434,251.—ADDING MACHINE—D. L. Craig, Silver King, A. T.

434,731.—TRACTION ENGINE—J. B. Harris, Stockton, Cal.

434,417.—CLOTHES HOOK—Chas. Hill, Portland, Ogn.

433,943.—JOINTS FOR SUCTION PIPES, ETC.—W. P. Humphreys, S. F.

434,339.—CARTRIDGE SHELL LOADER—C. A. Hussey, Ft. Bidwell, Cal.

434,064.—SPRING MOTOR—Jno. Isele, San Diego, Cal.

434,734.—MITER BOX—A. E. McMillan, Oakland, Cal.

434,352.—CROSSCUT SAW—W. A. Miller, Wapimita, Ogn.

434,135.—ROTARY BLOTTER—E. E. Park, S. F.

434,356.—TYPE WRITER COPY-HOLDER—Pipes & Pernot, Corvallis, Ogn.

434,401.—NAILLESS HORSESHOE—S. Pruden, Los Angeles, Cal.

434,369.—OPERATING PUMPING ENGINE—J. F. Whiting, Albany, Ogn.

The following brief list by telegraph, for Aug. 19, will appear more complete on receipt of mail advices:

California—Frederick H. B. Babbe, Santa Rosa, portable bedstead; Mora M. Barrett and J. F. Daily, S. F., gas or vapor engine attachment; Isaac K. Clever, Deadwood, hanging-up attachment for stamp batteries; Richard E. Eads, Gerson, and A. J. Eads, Pomona, animal trap; J. Weaton, Placerville, bandle for hammers, mallets and other striking tools; Milo P. Holmes, S. F., lifting-jack; Oscar A. Horner, assignor of one-half to R. B. Emerson, Eureka, gun sight; William F. Mitchell, S. F., leaf twiner; Emil F. Moening, S. F., safety device for elevators; William D. Nelson, Traver, slat protector for drapers; George Pardy, deceased, W. Pardy, S. F., executor, riveting machine; Frank Rademacher, assignor of one half to H. H. Leithad, steam condenser and water heater; Josiah H. L. Tuck, S. F., subsoil irrigator and fertilizer; George E. Woodbury, S. F., belt or apron for ore concentrator; Dueber Watch Case Manufacturing Co., Canton, Ill., Cincinnati, O., Newport, Ky., Chicago, Ill., New York, Boston, Mass., and San Francisco, composition watch cases. Oregon—John T. Durkee, Portland, fireproof paint; Peter Wilhelm, Portland, stove-lid and center piece and lifter therefor; Thomas C. Wilkins, Independence, harvester. Washington—Charles O. Heacock, Tacoma, tool-box.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TRACTION ENGINE.—Jerome B. Harris, Stockton, assignor of one-half to John Gambetti. No. 434,131. Dated Aug. 12, 1890. This patent covers an improved form of driving mechanism for traction engines. The object is to so arrange the driving mechanism that when called into action, and while operating, the dead weight of the frame and the carried parts is transferred from the axis of the carrying or driving wheels to a point outside of, or beyond said axis, and near the wheel's rim, whereby said weight is utilized to assist the positive power in turning or driving the wheels. By the construction employed, when the machine is starting and advancing it has not only the positive driving power of the engine, but also a supplementary power constantly acting and due to the weight of the machine bearing down on the wheel near its rim.

ROTARY BLOTTER.—Edward E. Park, S. F. No. 434,135. Dated Aug. 12, 1890. This device is for use as an ink-blotter. It consists of one or more cylinders built up of endless tubular sheets of blotting-paper or material increasing in diameter so that each exterior tube may be slipped over the interior ones, and in a frame-work in which one or more of said devices may be journaled. Whenever the superficial porous tube has become so much saturated that it ceases to be of use, it is only necessary to cut it with a knife and remove it, when a fresh surface will be presented, which will be used in like manner until worn out. These cylinders being made in quantity, can be supplied to the trade, and it is only necessary to purchase them and introduce them into the handles or holders whenever necessary.

CONDUCTOR'S RECORDING PUNCH.—Arthur W. Coffin, Oakland, assignor to the Coffin Combination Punch and Ticket Co. No. 434,142. Dated Aug. 12, 1890. The object of this invention is to provide a simple and efficient conductor's punch capable of carrying within itself a necessary number of tickets and their duplicates, both of which in their simultaneous passage through the machine are similarly marked or punched, one being given to the passenger and the other retained in the machine.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

MECHANICAL PROGRESS

Electro-Deposited Copper Steam Pipes.

We have already made brief reference to the Elmore copper-depositing process by which copper steam pipes are made free from welds or joints of any kind. It is well known that the ordinary copper steam pipes are a great source of annoyance and failure, and it must be an extreme satisfaction for steam-users, who have heretofore employed copper pipes under high pressure, to learn that they will soon be able to obtain those of a much superior and most satisfactory quality. The material of these electro-deposited pipes is described as perfectly wonderful, for it is said to have a tensile strength of 25 tons to the square inch, with an extension of 20% in breaking.

These pipes seem to offer absolute security even with the very high pressures now employed. According to *Engineering*, each pipe has etched upon it the results of a test which is made of a strip cut from its end, and thus the engineer is relieved from anxiety as to how it will behave. Even without this guarantee he could have little cause for anxiety, for the process of manufacture does not admit of any irregularity of chemical composition. The pipe consists of pure copper, free from admixture with other metals, and the only variation which can occur is in its hardness. It is possible to secure hard or soft metal at will, according to the purpose for which it is to be employed, and of course it is important that the hard varieties should not be used for steam pipes.

Every one is aware that copper can readily be deposited from its solutions. Practically all the crude copper which comes into this country is refined by electric deposition. By means of currents derived from large dynamo machines the Chili bars are dissolved, the pure copper being thrown down on the cathodes in rough nodular masses, and the impurities, often containing gold and silver, being left as mud in the bath. Hence it costs but little more to deposit the *tubes* direct from the crude Chili bars than it does to purify these bars by the same mode of deposition in the first place. The cost of purification is saved and the additional cost of the manufacture relates chiefly to engine-power and rent, labor being comparatively an insignificant item. When a mandrel is put into a tank it remains there for one or several weeks, slowly turning round, and only needs the slightest attention until it is ready to be lifted out and to be replaced by another. All this time the process goes on automatically, and there is scarcely any expense except that for driving the dynamo. It is certain that this cannot be great per pound of copper deposited.

In the old method the refined copper has afterward to be melted, with the chance of oxidizing it, cast, and rolled into bars or sheets. If it is desired to obtain the copper of soft quality and even texture, it is necessary that the process be carried on very slowly indeed. If any attempt be made to hurry it, the result is a coarse, granular metal entirely wanting both in strength and ductility; hence the imperfection in the present method of making copper pipes.

The Elmore tubes are deposited on a properly prepared core at the rate of $\frac{1}{40}$ inch in thickness per week of 144 hours, or 6 pounds per square foot of surface. The process by which they are produced differs only in one respect from that hitherto followed in the electro-plating of rollers for calico-printing machines. The surface of the copper is continuously burnished by an agate the whole time, and as rapidly as the particles of copper are formed they are rubbed and matted into those beneath and beside them, thus forming a fibrous plate of perfectly uniform structure and great strength. So closely are the particles interlaced that the specific gravity is increased until a plate one-eighth of an inch thick weighs 6 pounds to the square foot. As the mandrel on which the tube is formed rotates in the bath of copper sulphate, the agate travels along it, forming a fine spiral on its surface, the speeds being so arranged that only a very fine film can form between two applications of the burnisher to a given spot.

The physical properties of the metal depend, to a certain extent, upon the rate of deposition and the thickness of the film burnished. This last is usually 7-1000 inches, but it is subject to variation. For instance, steam tubes are usually thickened up at the ends for the flanges to be attached to them. To this end, the anode of common Chili bars is placed nearer to the ends of the tube than to the rest of the length. The electric resistance is therefore decreased at those points, the result being an increased density of current and a thickening of the tube. The ends are thus rendered thicker and softer, so that they can be very readily flanged. These flanges do not serve alone for the union of successive lengths of pipe. Gun-metal flanges with grooves in their faces are first slipped over the cylindrical tubes, and then the ends are rolled over into these grooves, into which they fit exactly. By varying the position of the anode, other alterations of form can be effected. For instance, when it was intended to bend the Elmore tubes by the ordinary process it was proposed to make them thicker down one side than the other, so that the stretching which takes place on the other side of the bend should not reduce the general strength. To do this, the mandrel would have been mounted eccentrically, the result being that the side which approached nearest to the anode would have been the thicker of the two. However, since the introduction of the Fowler bending machine it is not necessary to do this. This machine, an American invention, will bend a pipe of any size without extending the metal on the outer side of the curve. In place of this, it sets up or thickens the metal on the inner side.

Electrically deposited burnished copper may be applied for many purposes besides steam pipes. Indeed, since all copper is electrically deposited, and the burnishing only takes the place of remelting and casting, it is quite possible that the new process may serve for the preparation of every variety of copper goods, and copper electro-plated goods as well.

THE LINK MOTION THE BEST.—A committee of the American Railway Master Mechanics' Association, in a report on the efficiency of the link as compared with other valve motions, state that nowhere is "the survival of the fittest" more pronounced than in railroad practice, and that in America the link has outlived all its rivals. It has, they say, been urged against the link that it is not a scientific or true mechanical motion. This may be true, but the fact remains that fairly good results are obtained from it; that it will take more punishment in the shape of rough usage and neglect, and cost less to make and repair, than any form of valve motion now being experimented with on locomotive engines. They further state that poor results obtained from a locomotive are often unjustly charged to the valve motion, when the cause may be found in contracted steam ways, leaky valves and pistons, and similar defects; and in conclusion they add that no valve motion brought before them is more efficient for all-round work and general utility than a well-designed link with large bearing surfaces. As for the Strong valve gear, for which very high claims have been made, Mr. Ross Kells of the New York, Lake Erie & Western road reports that on his line they have found the link motion fully as economical in coal and more economical on maintenance of the valve gear.

PRESS FORGING.—The distinction between melted metal flowing into molds by gravity and being forced into molds by pressure, when only softened by heat, is not so great as people imagine. The first is as old as civilization; the latter is a new process, developed and made possible by implements of recent invention. All over the world, press forging is increasing. Presses to exert thousands of tons are now common, and the most intricate forms are produced by the flow of metal heated only to redness, the same as it would be for hammering. Even in San Francisco a good many things are being forged by pressure that were formerly cast, notably the parts of "cable grips" and like things are produced by "presses," nearly as cheap as castings of malleable iron or steel. The latest things in such forgings are railway axles. Blanks of a uniform section are placed in dies which form a matrix, having the form of a completed axle, with its necks and collars. Powerful plungers driven by hydraulic force act on the ends of the blank, forcing or "flowing" it into the mold, just as castings are made of fluid metal. The work demands celerity to prevent cooling by radiation, but the process is no doubt a practical and economical one.—*Glasgow Engineer.*

MECHANICAL DEVICES.—Perhaps, says a contemporary, one of the best examples of a mechanical device working its way into great prominence against early prejudice is found in the steam pump. When the late Henry R. Worthington invented his direct-acting steam pump and proposed to use it for feeding boilers, he was met by eminent engineers to whom he showed it with the remark to the effect that, while it was ingenious and all that, no one wanted such a pump. This was the first reception of a machine which, in various forms and modifications, made by different manufacturers and for different purposes, is in use in every civilized country in the world and on board every steamship. No one doubts its utility or its influence on mechanical progress. Perseverance won in the instance of the steam pump, as it has in the instance of many another invention. It is not wise to drive bull-headed against all mechanical opinion, and it is equally unwise to be turned aside by every contrary opinion. Mr. Worthington's belief in himself has been an excellent thing for the world.

IN WORKING STEEL BY HAMMERING, or drawing it down by the process of rolling, it is a well-known fact that the steel forming the corners becomes more dense by the operation, or has the appearance of being refined, for where drills for cutting stone are used they are found to work much better by having the bit or cutting edge come in line with those compressed edges. In rolling eight-square steel, the line of dense metal comes in the form of a Maltese cross, and as the bit of a rock drill, where power drilling is made use of, is something of the same form, care is taken to have them coincide. The etching process must show this action of steel perfection, if a section could be worked off true and even and polished; after hardening, the etching fluid will take hold of the softer metal with greater freedom, bringing out all the features that can be contributed to the action of the hammering or the refining from the rolling operation.—*Ex.*

SCIENTIFIC PROGRESS.

The Planet Venus.

The Italian astronomer Schiaparelli, who recently discovered the fact that Meronry performs only one rotation on its axis during its entire revolution around the sun, and who has made more discoveries in our planetary system within a few years than all other astronomers put together, has just announced another important discovery. He now asserts that Venus, the brightest of all the planets, the twin sister of the earth, also turns but once on its axis in the course of a revolution around the sun. In other words, there is no alternation of day and night on Venus, as on the earth. The planet enjoys perpetual day on one side of its globe, while the other side is plunged in unending night, just as is the case with our moon.

Astronomers have heretofore believed that the time of Venus' axial rotation corresponded almost exactly with that of the earth's. This was supposed to have been established by noting the return of spots visible on Venus to a similar position night after night, but Schiaparelli shows that these observations have probably been misinterpreted, and that instead of indicating a rotation period of 24 hours, they rather confirm his conclusion that the rotation is performed in 224 7 days, which is the time the planet takes to complete a revolution around the sun.

Schiaparelli says the axis of rotation of Venus is nearly perpendicular to the plane of the orbit. If that is so, Venus has no diversity of seasons such as the earth enjoys. Its equator forever burns with the heat of an unending summer, and its polar regions undergo no change of temperature. The equatorial heat on Venus is vastly greater than that on the earth from the fact that her distance from the sun is only two-thirds that of the earth. Moreover, the fact that her heat is unbroken by the alternations of night and day must still more greatly intensify the temperature of the sunny side of that planet. The cold of the opposite side must also, for the same reasons, be greatly intensified.

There may, however, be some modification of the direct and continuous heat of the sun on Venus. All telescopic observations of the planet testify to the blinding brilliancy of its surface, and the most reasonable hypothesis yet put forth to account for this phenomenon is the existence of an extraordinary amount of cloud in its atmosphere.

Anybody who has watched a sun-illumined cloud knows how splendidly it reflects the light, and, of course, in looking at the clouds of another planet, we can practically see only their sunny side. If, then, as appearances indicate, Venus' atmosphere is largely filled with clouds, the effect would be to screen off the superabundant sunshine, and perhaps render even perpetual daylight far less obnoxious than we might, at first sight, be disposed to regard it. There are reasons for thinking that the atmosphere of Venus is most abundant. Its depth has been calculated to exceed that of the earth by about one-third, although Venus is a slightly smaller planet than ours. The existence of watery vapor in this atmosphere has been clearly established by spectroscopic examinations. Of the extent or even the existence of oceans on Venus we know nothing by direct observation, but since the planet possesses an atmosphere and clouds, it is not unreasonable to conclude that it must have oceans capable of supplying the needed vapor.

Coloring Metals by Oxidation.

The cause of the appearance of annealing colors has generally, although without proof, been ascribed to the oxidation of the iron. Herr S. Stein, well known from his experimental investigations of iron and steel at high temperatures, in the *Deutscher Ingeniure*, has now conclusively shown that belief to be well founded. Pieces of iron and steel were carefully cleaned with alcohol and ether and put into a glass tube; the air was exhausted and replaced with pure nitrogen, which was also pumped out in order to secure a thorough removal of the oxygen. The tube was then gradually heated, and as hydrogen and nitrogen generated from the metals they were pumped out. The inner surface of the tube, on its cooler parts, became covered with a white precipitate of a still unknown nature. The whole scale of the temperatures appropriate for the appearance of the annealing colors was tried, but these failed to appear, whereas they were called forth immediately on the admission into the tube of air with oxygen. Herren R Schwirkus and F. V. Lichtenstein have demonstrated in an experimental way that an increasing hardness of the steel necessitates an increasing heating to produce the same annealing color, and that the composition of the steel affects the conditions for the appearance of the different colors in a still higher degree than the hardness. The combinations of temperatures and colors in the ordinary manuals are thus entitled to only conditional correctness at best. Another series of experiments, relating to the influence on the colors of the duration of the heating, manifested that they can appear at even very low temperatures if they are only kept up long enough, and that the difference between hard and soft steel asserts itself here too. A soft piece exposed during several days to the heat of 177° C. showed purple after 68 hours, violet after 93, and dark blue after 120, whereas a glass-hard piece turned light yellow after 20½ hours, dark yellow after 27, orange after 50, and purple after 103. At higher temperatures, the colors appear with shorter intervals.—*Iron.*

A LADY'S LOVE FOR ASTRONOMY.—A New York lady, Miss C. W. Bruce, offers the sum of $6000 during the present year in aiding astronomical research. In the hope of making it of the greatest benefit to science, the entire sum will be divided, and in general the amount devoted to a single object will not exceed $500. Precedence will be given to institutions and individuals whose work is already known through their publications, also to those cases which cannot otherwise be provided for, or where additional sums can be secured if a part of the cost is furnished. Applications are invited from astronomers of all countries, and should be made to Prof. Edward C. Pickering, Harvard College, Cambridge, Mass., before Oct. 1, 1890, giving complete information regarding the desired objects.

TURPENTINE FOR MICROSCOPICAL PURPOSES. As it is very difficult to obtain clear, nice turpentine for microscopical purposes, the following method of purifying it is recommended: Take one pint of the common turpentine and mix in a quart bottle with four fluid ounces of 98 per cent alcohol. Agitate well, and let stand until the two fluids separate. Decant the turpentine (which will form the lower layer) from the alcohol and mix it with one pint of clear water. Agitate thoroughly, and let stand until these two fluids separate, then from the water decant the turpentine (which this time will form the upper layer), and, finally, mix with the turpentine about one ounce of powdered starch, and filter through paper.

THE ARC IN THE TREATMENT OF ORES.—A special dispatch from St. Paul, of July 17th, says: C A. Dalgh of the Westinghouse Electric Company, has been in Tower, Minn., at the iron mines, for the last week, experimenting with electricity and iron ore in the interest of his company. He declares that he has discovered a process by which he can center the rays of an arc light upon a piece of iron ore and thereby soften it to such a degree as to be able to work it with a greatly reduced amount of labor. It has not as yet become known with what success his labors have met.

A NEW PROCESS FOR CHROME IRON.—A Norwegian engineer, Herr O. Olson, Christiana, has obtained a ten-years patent for a new process for the manufacture of chrome iron. In his process, a well-mixed proportion of finely pulverized chrome ore, powdered charcoal and tar are heated to red heat in a closed vessel, then allowed to cool, and finally remelted in a crucible, together with a certain proportion of pulverized iron ore, powdered charcoal, borax, ground glass, and cyanide of potassium. The proportions of the mixture are naturally kept a secret.

A NEW RAILROAD TIE.—A novel crosstie has just been patented by a Covington (Ky.) inventor. It consists of steel or wrought-iron tubing 8 inches in diameter and 12 inches long, fitted with proper supports to fit the rail on top and to rivet to a support at the bottom. Each tube has paper forced into it and guarded against moisture. Each piece of tubing acts as a cushion and support to the rail, while between the rails and securing these cushions is a substantial strip of iron. Great durability and strength are claimed for these ties.

SEEING SOUNDS.—M. Pedrone, a physician of Nantes, France, claims that he has the strange gift of being able to see the color of sounds. He says that human voices are red, blue, black, tan, slate and all colors, and that the color of some handsome women's voices is like that of buttermilk.

BIRD SONGS.—It is proposed that a permanent record be made of the songs of birds by means of the phonograph. "This done," says a correspondent, "the song could be reproduced leisurely and 'scored' by a competent musician. Thus art and nature would go hand in hand."

CYCLONES.—The conclusions reached by modern meteorologists are that cyclones of great intensity are ascending spiral whirls of wind having a rotary motion in a direction in the northern hemisphere opposite to the movement of the hands of a watch.

A WATERSPOUT formed on the bay off Escanaba, Mich., one day last week, lasting 15 minutes. It was 200 feet in diameter at its base, extending into the clouds, and made a noise audible at a distance of two miles.

THE Broken Hill Proprietary Mining Co. of Queensland, the noted silver property, had a net profit in its operations for the half year ended June 30, 1890, of no less than $2 350,000, of which the shareholders received $2 320,000 in dividends, or nearly as much as the famous Ontario mine has paid in, in 170 dividends The total of dividends and bonus is no less than $11,080,000. There is also silver bullion on hand unsold, valued at $475,000, with supplies valued at $500,000.

THE Payne break in the Sacramento, a few miles below Boruck, is about 20 feet deep, and the cost of repairing it will be about $20,000.

GOOD HEALTH.

Health of the State.

The report of the State Board of Health for July contains reports from 100 cities and towns with an estimated population of 850,440. The number of deaths in these towns was 1132, or an annual mortality of 15 96, a somewhat increased rate over the report for June. The increase is attributed largely to stomach and bowel disorders incident to the season. The increase of temperature is also supposed to be an additional contributing cause.

Cholera infantum is reported to have caused 82 deaths, which is the largest mortality in any one month this year. The deaths from this cause in June numbered 51 and in May only 6, showing conclusively how much the disorder is influenced by increased temperature.

Heart disease caused 74 deaths. Cancer is credited with 37.

The Asiatic Cholera.

This dread disease shows no sign of abatement in Spain; on the contrary it is spreading; but, says the report, we are more concerned about its approach nearer home, the disease having made its appearance in Japan, with which country we are closely allied by commercial and industrial intercourse. We would call especial attention to the following paragraph in relation to this disease which we copy from the report:

The disease having been so clearly proven to be contagious through excretions from the infected body, the utmost vigilance will have to be exercised to prevent the transportation of these poison germs to our shores. But suppose all vigilance fails and cholera suddenly appears in our midst. The question that should present itself to every community in the State at this moment is: Are we prepared to repel the invader; are our cities, towns, hamlets and individual premises in such a state of order and cleanliness that disease can find no accumulated filth in which to incubate its germs? If they are, we have nothing to fear, as it has been stated by good authority that the cholera germ is innocuous when it leaves the human organism, and that it requires another medium outside of man to mature and complete its infective properties. That medium is a soil moist and saturated with impurities. If this assertion is true, it necessarily follows that the most complete safeguards against the spread of cholera are a clean soil, untainted air and pure water. The first may be attained by proper drainage, removal of superincumbent filth, garbage, all accumulations of dirt within or near our dwelling-places. Health boards and health officers should now be more vigilant than ever, and enforce, with all the power the law gives them, the proper cleansing of the districts under their charge. They are the officers accountable to the people for the preservation of their lives when threatened by disease.

COFFEE AS A STIMULANT.—It is asserted by men of high professional ability that when the system needs a stimulant, nothing equals a cup of fresh coffee. Those who desire to rescue the dipsomaniac from his cups will find no better substitute for spirits than strong, newly-made coffee, without milk or sugar. Two ounces of coffee, or one eighth of a pound, to one pint of boiling water, make a first-class beverage, but the water must be boiling, not merely hot. It is asserted that malaria and epidemics are avoided by those who drink a cup of hot coffee before venturing into the morning air. Burned on hot coals, coffee is a disinfectant for a sick-room.

DANGER IN THE PHONOGRAPH.—The Fairmount Park Commissioners at Philadelphia have ordered the phonographs banished from the park as a sanitary measure. The objections raised to it are that it is injurious to the public health, not only on account of a liability to cause deafness, but because of a liability to transmit disease of the ear by an indiscriminate use by the public of the ear-pieces. It was further claimed that the insertion of the hearing-tube into the ear is conducive to the contraction of various diseases of the blood owing to the contact which the tube must have with the membranes.

DIED FROM A BEE STING.—A correspondent writes the New York *World*: "I see by this day's issue that a lady in Jersey City died of blood-poisoning, resulting from a bee sting. Had she gone into the nearest laundry and rubbed the part affected with an indigo bag, she would now be alive and well of the sting. It is an effectual remedy. I know several cases where indigo applied in that simple manner cured. Perhaps you will give this a place in your valuable journal, and some of your thousands of readers may have cause to bless you."

REMEDY FOR NEURALGIA.—A correspondent who has been greatly troubled with neuralgia, after trying various remedies without success, finally found relief in the following: Dissolve one-half of an ounce of nitrate of ammonium in eight ounces of water; take one-half an ounce every four hours. In his case this gave immediate relief.

CANCER.—It is important to note that there is only one instance of death of a centenarian from cancer. It seems that the liability diminishes from about 45 to 55 onward, and that after 70 there is but little to fear in this direction.

USEFUL INFORMATION.

A FIREPROOF WHITEWASH.—It is found, says the *English Mechanic*, that a most effective composition for fireproofing exterior surfaces may be formed by slaking a sufficient quantity of freshly burned quicklime of the best grade, and when the slaking is complete, there is added such an amount of skim milk, or water in its absence, as will make the liquid of the consistency of cream. To every ten pounds of this liquid is added separately and in powder, stirring constantly, the following ingredients in the order named: Two pounds of alum, 24 ounces of subcarbonate of potassium or commercial potash and one pound of common salt. If white paint is desired, no further addition is made to the liquid, though the whiteness is found to be improved by a few ounces of plaster of Paris. Lampblack has the effect of giving it a number of shades, from slate-color to black. Whatever tint is used, it is incorporated at this stage, and the whole after being strained through a sieve, is run through a paint-mill. When ready to apply, the paint is heated nearly to the boiling-point of water, and is put on in its hot condition. It is found that the addition of a quantity of fine white sand to this composition renders it a valuable covering for roof and crumbling brick walls, which it serves to protect.

COWHIDE HORSESHOES, it is said, are fast coming into use in England and in many parts of the continent of Europe. It is claimed for this styled shoe that is much lighter, that it lasts longer, and that split hoofs are never known in horses using it. It is perfectly smooth on the bottom, no calks being required, the shoe adhering firmly on the most polished surface. Its elasticity prevents many sprains, the horse's steps being lighter and surer. It is said that straw, treated with chemicals unknown, has been used for horseshoes for centuries in Japan.

DEEP SHAFTS.—The deepest mining shaft in the Australian hemisphere is the George Lansel, No. 180, at Sandhurst, which has reached 2640 feet, or exactly half a mile from the surface. The last reef passed through was 2600 feet, and from indications it is believed that it will prove both a large and valuable lode. Sinking has for the present been discontinued. The deepest perpendicular shaft in this country—in fact in the world—is the Combination shaft on the Comstock, at Virginia, Nevada, which is 3300 feet in depth.

ESTIMATING FOR PAINT.—It is found that in painting wood one cost takes 20 pounds of lead and 4 gallons of oil per 100 square yards; the second coat, 40 pounds lead and 4 gallons oil, and the third the same as the second, say 100 pounds of lead and 16 gallons of oil per 100 square yards for three coats. The number of square yards covered by one gallon of priming color is found to be 50; of white zinc, 50; of white lead paint, 44; of lead-color, 50; of black paint, 50; of stone-color, 44; of yellow paint, 44; of blue color, 45; of green paint, 45.

TAKING PHOTOGRAPHS.—In regard to beauty, a photograph tells nothing beyond form of face. A photographer, explaining a lady's antipathy to the camera, said: "Her features are not regular, and she takes a bad picture. Her beauty rests in her deep liquid eyes, coral lips, rich auburn hair, and lovely complexion, qualities precisely which a camera cannot reflect. On the other hand, a woman dull of eye and faded of hair may make a capital photograph, if she has a straight nose and a tolerably good outline of features."

LARGE ESTATES.—It is generally supposed that this country can discount the world in the extent of some of its landed estates; but it appears that Australia may possibly go us better. Three estates were recently advertised for sale in Queensland, the first of which has an area of 454 square miles, of which the rent is $1600; the second has 648 square miles—about 415,000,000 acres—and the third 553. The one most advantageously situated is "within 100 miles of a railroad."

VALUE OF PATENTS.—A short time ago it was revealed, in the course of a lawsuit, that stock in a baking-powder company in New York had reached the enormous value of $4200 a share, the original value of such shares being $100. A few days ago a patent-medicine man sued his wife, and incidentally it was stated that 49 shares of the patent medicine had paid the enormous dividend of $49,000 in one year.

TO REMOVE PAINT FROM SILK.—Paint can be removed from silk goods by first saturating it in equal parts of turpentine and ammonia, then washing it in soapsuds, and letting it dry between blotting paper under a heavy weight.

THE owner of a new tire, made of hollow spring steel, circular, oval or square, thinks that it will succeed rubber tires for wagons or bicycles. It can be fixed on so that it can never come off.

TO CLEAN OILCLOTH.—Use a wet towel pinned over a broom, rub with long sweeping stroke, and polish with a mixture of linseed oil, beeswax and turpentine, rubbing it in well.

ENGINEERING NOTES.

The Nicaragua Ship Canal.

A Triumph of American Engineering.

The inactivity which has for some time thrown a shadow over the Nicaragua ship-canal enterprise has now passed away and preparations are being made for a new and more energetic pushing of the work. Operations have been somewhat delayed on account of the uncertainty of the success of the efforts being made to reopen the harbor of San Juan del Norte or Greytown, as it is now more generally called, the port of entry for the canal at the Gulf terminus of the canal.

San Juan Del Norte was at one time one of the finest harbors in the world, but the flow of the San Juan river down from Lake Nicaragua brought with it quantities of leaves, weeds, plants, trees, etc., which, as years wore on and no attempt was made to clear them away, clung together, formed small islands and thus destroyed a once grand harbor. The land and sand bars thus formed have built a series of barriers between San Juan and the sea, the result being that it is only by navigating a maze of passages that San Juan has for years been reached.

In the inception of the work of reopening the harbor, several well-known engineers were called upon to devise plans and estimate the cost of the reopening. An American, an English and a French engineer each made examination and estimates. The English and French engineers each estimated the cost at from eight to ten millions of dollars—a much larger sum than had been calculated upon by the promoters of the canal.

The American engineer, Mr. Menocal, who is the chief engineer of the canal company, suggested a plan which would not involve an expense exceeding two millions. He proposed to simply build a breakwater some 1800 feet in length, which he claimed would so turn the drift current that the action of the sea in connection with the usual current of the San Juan river would wear away the obstructing sand bar, deepen the channel and keep it forever at the proper depth for navigation. The English and French engineers agreed in the opinion that the breakwater scheme would not work, but that either the one or the other of their more expensive plans would have to be adopted. The canal projectors decided to try the Menocal plan, and have rather held back on the work upon the canal proper until the action of the breakwater should make itself known. This has now been reached with the most satisfactory results and greatly to the credit of the American engineer.

According to the *Journal of Commerce* of this city, on the 10th of July there were eight feet of water at low tide on the bar north of the new breakwater and the Bloefields steamer had crossed in safety and anchored in the old harbor, the first vessel that had crossed the bar in 23 years. The new harbor dredge of the Canal Company has also crossed in safety, also two large tugs and other craft.

Two vessels were in the harbor discharging piles, which will be used in extending the breakwater, which, when completed, will be over 1800 feet long, with 36 feet of water at the end.

The railroad, which is being constructed from the harbor to the "Divide," will be finished by the middle of this month. It is from this "Divide" that the stone need in the construction of the breakwater will be procured.

On the western division the engineers are at work staking out the ground that will be required by the Canal Company. This ground is all held by private parties, and as soon as the Nicaragua Government can place the Canal Company in possession of the property, the construction contracts will be let and the work forced to an early completion.

This great work is being conducted in a very quiet and unassuming manner. There seems to be no want of men or money, and with such a man as Hon. Warner Miller at the head to guide matters, we can all rest assured that we shall in good time see the great ships of the world crossing the continent and bound for San Francisco.

AN AMERICAN-BUILT BRIDGE IN AUSTRALIA. The piers of the great Hawksbury bridge are found to show a lateral movement amounting to 2½ inches at its maximum. This bridge, which is in Australia, and which was built by American engineers and contractors, is chiefly remarkable for having its foundations deeper than any other bridge in the world. The deepest pier is a monolith 200 feet high. Some consider that a small amount of motion is inevitable on the summit of a pier of this hight, while others contend that it shows that the piers have an irregular bearing at their base and probably rest on a ledge of rock at one corner. There is no vertical movement. The bridge is double-track, and trains, some of them double-headers, run over it at the rate of 30 miles an hour. Another theory is, that as the load on a double-track bridge is not exactly above the center line of the pier, a slight rocking may be caused by the vibration set up by the passage of the trains.

A NEW FRENCH CANAL.—The French Minister of Public Works has just inaugurated a canal from the Aisne to the Oise. It has been constructed to facilitate traffic by water between the north and east of France. Although the canal is less than two miles in length, it will, nevertheless, reduce a voyage between the north and east of France by no less than 36 miles. The works upon the new canal comprise two canal bridges, 13 sluices and a tunnel 2628 yards in length. The piercing of this tunnel was attended with many engineering difficulties.

ELECTRICITY.

MOTOR CONSTRUCTION.—The changes which have been brought about and are still going on as a consequence of the introduction of the electric motor afford a most interesting study, not only from the mechanical, but from the social, standpoint as well. The effect seen in the development of the steam engine alone would form an interesting chapter of history, leading to the irresistible conclusion that electric lighting and electric-power have contributed more than any other influence to the perfection of the high-speed engine. High speed was, indeed, necessitated by the construction of the dynamos and motors heretofore generally employed, in order, chiefly, to avoid as much as possible the use of counter-shafting. While the tendency to the reduction of speed in dynamos has made itself felt for some time past, it is but comparatively recently that this idea has gathered force with regard to electric motors. The reasons which have led to this new departure are, we think, not difficult to discern. It is, indeed, but the natural outcome of the endeavor to bring the speed of driver and driven shaft as nearly to uniformity as possible, in order to avoid intermediate gearing, whether it be reducing or multiplying. The direction in which the tendency in question seems likely of accomplishment, practically, is in the employment of multipolar machines.

SLAUGHTERING BY ELECTRICITY.—An apparatus has been devised and patented for slaughtering by electricity. It is claimed by the inventors that their method of killing animals by means of a high-tension electrical current is less cruel and barbarous than the ordinary method. They also claim that the animal bleeds more freely, and that the meat is benefited by the passage through it of an electric current. The inventors state that meat slaughtered by this method will keep longer than by other methods, and that pork slaughtered by electricity is found to be entirely free from trichinæ. The apparatus consists in a pen provided with a metallic floor divided into two sections, an electric generator for supplying a current of sufficiently high tension for the purpose, and a hand electrode for applying the current to the animal. The pen rests upon insulators, and one portion of the metallic floor is connected with the dynamo. The animal to be killed is first driven through a shallow pool of water to wet its hoofs, so as to secure a good electrical contact with the sections of the metallic floor. When the animal stands partly upon each section, it may be killed by bringing the electrode into contact with the rear part of the floor.

THE BOOTBLACK'S INDUSTRY THREATENED.—Another industry which seems destined to be stirred to its very depths by the advent of the electric motor is that of the bootblack. The first blow at what will soon be regarded as the ancient practice of shining by hand has been dealt in Chicago, where electrical blacking machines are now at work on the streets. The outfit is of the simplest description. A small motor is concealed in a box beneath the footrest of the bootblack's chair; a flexible shaft, with one end attached to the armature spindle, has the other fitted with a revolving polish brush. The only other element in the outfit is a push-button, and when this is touched the brush spins round at a speed that laughs to scorn the deftest hand that ever gave the exultant finish to that portion of the morning toilet. The increased capital which the new plant will involve, and the larger amount of business which a single individual may do, will somewhat deplete the number now engaged in that useful occupation.

NEW ELECTRIC MOTOR.—*Practical Electricity* says: "A new electric motor is coming into the field. We have been permitted to see it in operation, and also to study its construction. It is a motor which, if all accepted electrical theories are correct, ought not to 'mote' at all; that it does do this, however, is our justification for speaking of it at this time. Moreover, its efficiency is high, and for a given power its weight scarcely exceeds a third of that of any railway or stationary motor now on the market. As soon as the inventor, who is a gentleman well known in the science, and the company which will exploit the invention shall give us permission, we shall take pleasure in describing the new wonder."

ELECTRICITY A LION-TAMER.—The use of electricity is offered to the lion-tamer in the form of a light wand, with an insulating grip for the hand, connected by a flexible wire with a battery of which the power can be varied at will. An experiment with this form of applied science has been successfully made.

AN OLD INDUSTRY REVIVED.—There are 35 men in Suffolk, Eng., still employed in making gun-flints, or "flint knapping," as they call it, for the use of the remote savages who have succeeded to the long-discarded flint guns and pistols of civilization.

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Passing Events.

Congress is about to consider a proper classification of mineral lands, a step which, if taken long since, would have saved much litigation between agricultural and mineral claimants. The classification of public lands has been passed upon in a very loose manner heretofore, and a great deal of mineral land has passed from the public domain into private ownership.

The preliminary trials of the new war vessel San Francisco show a very high speed, and it is probable that the Union Iron Works of this city will get quite a handsome bonus for excess in speed. It is to be hoped the San Francisco will show a higher speed than the Eastern-built vessels.

It is probable that public attention to the matter of the destruction of the "big tree" groves of California will result in a withdrawal of all such groves from public entry, as has been the case in the Tulare county section.

Very extensive preparations are being made toward celebrating the 40th anniversary of California's admission into the Union, and it is probable that a good many of the early pioneer miners will come from the mountains to the city on the occasion.

THERE is a blackberry bush on the place of B. Donovan, in Santa Rosa, that measures 16 feet in hight. The vine is now only one year's growth, and Mr. Donovan thinks it will reach the remarkable hight of 20 feet.

THE new cruiser San Francisco, built by the Union Iron Works in this city, has steamed over 19 knots in her preliminary trials in the bay.

Milling Comstock Ores.

The president of the Crown Point Mining Company states that in our editorial which appeared in last week's issue under the caption of "Assays and Mill Losses on the Comstock," we did an injustice to his company. He says that the discount on silver was not taken into consideration when we gave the average yield as per bullion report. The figures given by us were taken from the sworn statement of the superintendent of the company, and were by us considered as reliable, and therefore published and criticised in a friendly spirit. But to allay suspicions of unfairness, we asked the president to give us his figures and any comment he deemed necessary. He gave us the following returns for the quarter ending with June: 9960 tons of ore milled; gross assay value, $156 250.06, which yielded a net return of $137,362.35, showing a discount of $18,887.71. In order to arrive at a better understanding of the situation, we asked for the mine assays and battery assays and the bullion returned as per Mint certificate. Although the law requires that the mine assays be given, no such returns are reported, but the battery and net returns were given as follows by months:

	Tons milled.	Pulp assay. Gold.	Silver.	Net return. Per cent Gold.	Silver.	saved.
April.....	3650	$8 40	$11 16	$6 89	$8 58	78.73
May.....	2860	9 14	12 08	7 02	8 78	74.46
June.....	3450	7 74	10 60	7 03	8 79	85.83

The percentages saved by months were as follows in gold: April, 81.17; May, 76.79; June, 90.88; and in silver as follows: April, 76.88; May, 72.69; June, 82.09.

These figures upon analysis, according to our understanding of the situation, scarcely show the improvement that was to be expected. The discount on silver should, however, undoubtedly, have been considered. It is well to note also that as the amount of taxes is based on the sworn returns that we quoted last week, it is but natural to charge up as expenses all that can be charged such, as office in San Francisco, etc.

It should be borne in mind that our comments on this subject have not dealt with the lineness managements of the companies in any way except as regards the milling of ores. It is that branch of Comstock mine management which is creating dissatisfaction, and the facts concerning which we are anxious to see fully ventilated. There is no intention or desire on the part of the PRESS to do injustice to any men or mines, and in case any statements which are incorrect find their way into our columns, we shall be glad to be put right by those in a position to clear up any doubtful points.

As in the editorial of last week, mention was also made of the Consolidated Virginia ores, we have obtained from that company the July returns of the milling, from the results of which our readers may draw their own conclusions. The figures from the sworn statement published last week showed that the returns from the Consolidated Virginia and California gave an average pulp assay of $22 34 per ton for the quarter, of which they saved 65.35 per cent, or $14 60 per ton. The report of the ore milled by this company for the month of July is now at hand and proves correct our claim that 85 per cent of the pulp assay can be saved when the rock is properly milled. The July report of the two mills that reduced the Consolidated Virginia ore is as follows:

The Morgan mill crushed 3475 tons of ore yielding bullion $50,692. The average of the pulp for the month was $17.20 per ton; the net yield $14.58 per ton, which is 84 77 per cent of the pulp assay.

The Eureka mill crushed 6940 tons of ore yielding bullion $98,731. The average of the pulp for the month was $16.10 per ton; the net yield $14.22 per ton, which is 88 33 per cent of the pulp assay.

The average of these two mills for the month of July is 86.59 per cent, or 21.24 per cent more than the average for the quarter ending June 30th, the difference meaning a loss to the stockholders of this company for that quarter of $168,198 90. The rock crushed in July is presumably of the same character as that crushed in the preceding quarter. The mills are the same, the men operating them the same, and the methods pursued in handling the ore the same. Whereln, then, does this difference lie?

Taking 10,415 tons of the ore crushed for the preceding quarter, and comparing it with the same quantity crushed in July, we find as follows:

Crushing in quarter ending June 30th, 10,415 tons; average pulp, $22 34 per ton; bullion produced, $152,059. July crushing: 10,415 tons; average pulp, $16.65 per ton; bullion produced, $149,423, making a difference of $2636.

These figures show that according to the Comstock milling methods, the same quantity and character of ore worked by the same mills, the same methods and the same men, and yielding $5.69 a ton more, gives only $2636 more bullion!

The mine assay for the July output of Con. Virginia has not been given. It is to be regretted that this has been omitted; we suppose the omission to be unintentional.

It is proper to notice here that while the per cent of the bullion saved from the pulp has increased 21 24-100 per cent, the pulp assay of the rock milled has apparently decreased 25 47-100 per cent. If we had the car sample assays, this difference would be clearer, but in their absence we are left to grope in the dark. We hope that in the future the various companies will obey the law and give these car sample assays, as the stockholders consider them necessary for their enlightenment. We notice that the Overman Mining Co. in their last weekly report has done this, and there can be no reason why the balance of the companies should not do the same.

Gravel Mining.

In this number of the PRESS we conclude the series of articles on "The Gold Belt of Northern California," by Mr. James F. Talbott. These articles are of an eminently practical character, embodying as they do, the personal observations of a man who has been a miner in the gravel regions since "early days." While the articles deal with only one section of the mining region of this State, the deductions are applicable to other gravel-mining regions as well.

We do not remember having seen in print anywhere a better description of the conditions existing in the gravel mines in this State than this of Mr. Talbott. Making no pretense to scientific knowledge, and having no new theory to advance, he has explained to our readers in simple language what has come under his personal observation while working in the gravel mines and seeing the work of others. The indications and surrounding characteristics of the lava-capped ridges where rich drift mines are to be found are pointed out and the courses of the old river channels (as he considers them) are described with accuracy.

While not intended as an answer to the previously published excellent article of Mr. Henry G. Hanks, who holds a different theory of the formation of these gravel deposits, most of the facts stated by Mr. Talbott are in support of the old theory of ancient river channels so long held by the miners of this State. It is to be hoped that others will be induced to enter the discussion of this subject, so important to the mining industry of California, and we should be glad to afford space to any correspondents who have any views to advance.

ACADEMY OF SCIENCES.—At the meeting of the Academy on Monday night, Mr. Vaslet read a paper written by Dr. Edward Palmer of the Agricultural Department at Washington on the customs of the Coyotero Apaches of Arizona. The paper dwelt upon their peculiarities of dress and diet, their habits of living and their social customs. The committee to whom was referred the matter of considering means for preserving the redwood forests of the State presented a memorial to Congress, which they had prepared, setting forth the destruction and threatened annihilation of the sequoia gigantea in this State, and the desirability of some action looking to the prevention of their further destruction. It suggested that all lands upon which there are redwood forests be withdrawn from sale and be converted into national parks. The report of the committee was adopted and further action postponed for two weeks in order to prepare plans and maps to accompany the petition.

A BULLETIN of the Census Department shows that there has been an increase of 6,000,000 tons of pig iron over the figures of ten years ago.

Damming Back Water in Mines.

When a large influx of water occurs in a mine, when the pumps cannot handle it, dams are sometimes built, so that only a portion of the mine will be flooded. Mr. H. A. Gordon, Inspecting Engineer of the Mines Dep't, N. Z., in his "Miners' Guide," shows one of the forms of dam used. The cuts on the first page of the PRESS show this dam. A taper chamber is cut out in the place where the dam is to be built, cutting the rock on the sides, roof and bottom as smooth as possible, in the shape shown in the accompanying cuts. Previous to commencing the excavation on the bottom, a low dam has to be placed across the adit some distance back from the place where the chamber has to be constructed, and the water conveyed in boxes to the shaft or to a point where it will be clear of the place where the work is carried on.

The excavation is then cut out in the bottom and the bottom set of square logs laid in position, with a coating of some soft plastic material, such as cement, to fill up all the pores in the excavation and allow the timber to be firmly bedded. Each layer is laid closely on top of the other, and each log is cut to the same taper so as to fit close together for the whole of their length. Four large baulks have to be fitted to form the center portion or man-hole for the workmen to get out after the whole of the logs are in position, and previously to this the center plug has to be left inside the dam. As soon as the whole of the logs are in position a battering-ram is used on the inside to drive every log home as close as possible.

When everything is ready for the plug to be inserted, a quantity of sawdust and moss, if procurable, should be placed inside the dam. This will, when the water rises inside, be forced into any little crevice in the logs or between the logs and rock, and tend considerably toward making the dam thoroughly water-tight. An eye-bolt is placed in the small end of the plug, whereby it can be drawn tightly into the hole by means of a lever, screw, or any other method that may be deemed desirable. If a dam be properly constructed in this manner, with the timber cut and fitted to the correct taper, it will form a dam that will last as long as the mine is at work. The water makes the timber swell, and very soon the dam becomes thoroughly water-tight. It is even better than either a brick or cement dam (so long as the timber does not decay).

Silver Purchases.

The course of the silver market since the new law went into effect, requiring the Secretary of the Treasury to purchase 4,500,000 ounces of silver a month, is a source of congratulation to bimetallists. The assertions made by monometallists, previous to putting the law into effect, that with an advance in the price of the metal in this country, we would be made Europe's dumping-ground, are not only proven fallacious, but the European countries are drawing supplies from us even at the higher prices now paid.

The tri-weekly purchases of the Treasury have been made at steadily advancing prices, as the following records show: On Aug. 15th all silver offered below $1.15 an ounce was accepted, but the quantity purchased was not given. On Aug. 18th the amount of silver offered to the Treasury Department was 340,000 ounces. The amount purchased was 290,000 ounces, as follows: 40,000 ounces at $1.13.5; 50,000 ounces at $1.12.5; 200,000 ounces at $1.19.75. The local purchases by mints from the 13th to the 16th inst., inclusive, amount to 82,177 ounces. The price of silver in London on the 18th was 54d. This is the highest point reached since April, 1878.

Subsequently offers were received from San Francisco to sell 50,000 ounces at $1.16, and 200,000 ounces at $1.18. Both offers were accepted. This made the total offerings on the 18th 990,000 ounces and the total acceptances 540,000 ounces. On the 20th the amount of silver bullion offered for sale to the Treasury Department was 1,314,000 ounces. The amount purchased was 466,000 ounces, as follows: Fifty thousand ounces at $1.1945, 16,000 ounces at $1.19875, 150,000 ounces at $1 20, 250,000 ounces at $1.2025.

LOS GATOS proposes to have water-works and sewers even if all the capital required is raised at home.

Lead Smelting Furnaces.

In the PRESS of last week a description was given of the furnaces in which the first regular attempt at lead smelting was made in the far West. They were built in 1866. In 1870 three blast furnaces were put up at Hamilton, White Pine, Nev., but were soon discontinued; then at Napias (now Eureka), Nev., a small furnace was put up to work the ores of New York Canyon, but the ores were unsuitable and the attempt to smelt given up. A small draft furnace was subsequently put up to work the rich carbonate ores, and some base bullion made. Buel & Bateman then built stone furnaces to reduce the ores of Ruby Hill, and did so with good results. In 1871, Messrs. W. S. Keyes and A. Arents put up large furnaces at Eureka. These were of the Piltz and Raschette types.

The Piltz furnace originated at Freiberg, in Saxony, and its horizontal section was octagonal; the octagon being flattened at the front or working side of the furnace. It was supplied with seven tuyeres. Fig. 1 shows a section from front to back, and Fig. 2 shows the ground plan. The upper portion was sustained by a cast-iron mantle, so that the interior portion, composed of firebricks, could, when burnt out, be easily removed without disturbing the superstructure. The section of the furnace widens upward toward the feed doors, which arrangement is exceedingly advantageous, in view of the fact that the charge becomes compacted as it descends toward the smelting zone. The gases as they ascend to the upper parts of the stack have an opportunity to expand, thus diminishing their velocity, and for this reason the amount of flue dust is very considerably lessened.

The Raschette furnace is particularly applicable to smelting both lead and copper ores, and is shown in the accompanying figures taken from the *Metallhuettenkunde* of Balling, published in Berlin, Prussia, in 1885. As originally constructed, it had two working fronts, and was proportionately very much longer than it was wide. Fig. 3 represents a side of the furnace; Fig. 4 represents a section through the working doors. It was found that this furnace put through in 24 hours from 40 to 50 per cent more ore than the round furnaces. The upper portion was like the Piltz, supported upon an iron mantle resting upon iron columns. This furnace to-day forms the basis of construction of all the more modern American smelters. As soon as Mr. Arents assumed charge as metallurgist of the works of the Eureka Cons. Co., he sought to improve on both the Piltz and Raschette furnaces, and, as a result, a furnace pictured in the accompanying sketches was built at Eureka, Nev.

Fig. 5 represents a section through the long sides of the furnace, and shows at the left the automatic or siphon tap, which will be further described hereafter; Fig. 6 represents a section from the front to the rear of the furnace through the slag-discharge or working door. The dimensions are given in meters and fractions. One meter equals 3.2809 English feet. This furnace distinguishes itself from all others heretofore built in the following particulars, viz: The introduction of the contracted inclined hosh, which is an eminently rational form of construction, for the reason that when the charge has become molten, and the fuel mixed therewith has fulfilled its office, the smelting material naturally becomes greatly diminished in cubical contents, and requires less space for its accommodation.

In Fig. 5 may be seen the automatic, or, as it is sometimes called, the siphon tap or lead-well of Keyes & Arents. In the sketch the tap *a* is incorrectly delineated, being drawn at too low an angle. It should be so constructed that a bar inserted from the outside will readily pass to the bottom of the furnace, an angle of 35 to 45 degrees being the most appropriate. On page 660 of Prof. Emmons' twelfth volume of the United States Geological Survey this tap is described as "one of the most important inventions ever made in the construction of smelting furnaces."

The accompanying figure, Plate 6, taken from the patent granted to the inventors, shows the exterior basin and the tube connecting it with the bottom of the furnace. As originally proposed by Mr. Arents, this connection was made directly downward from the bottom of the exterior basin to a point level with the bottom of the smelting furnace, and from thence by a horizontal channel. When this device was first attached to the furnace, the building took fire from incautious firing, and water having been poured upon the flames, ran down the side of the furnace and into the exterior tap-basins, chilling the lead and necessitating the reconstruction of the tap-basin and tap canal. On the suggestion of Mr. Keyes, the original right-angle connection was abandoned and connection made at an inclined angle, which long practice has since proved the more desirable form of application.

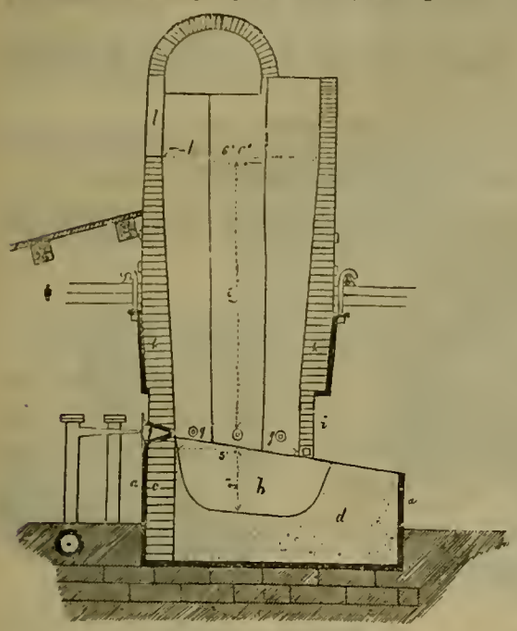


Fig 1.—SECTION OF PILTZ FURNACE FROM FRONT TO BACK.

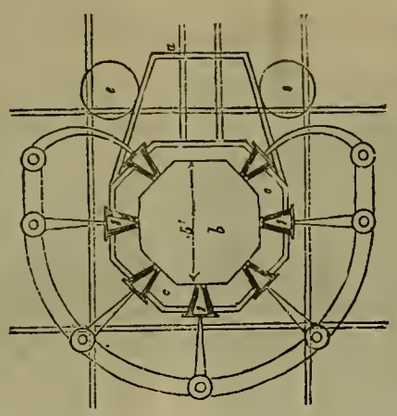


Fig. 2.—GROUND PLAN OF PILTZ FURNACE.

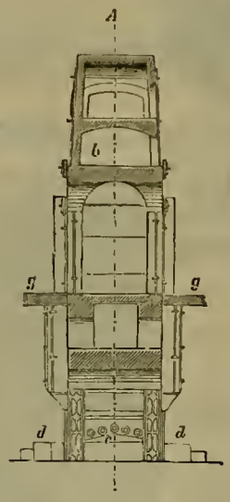


Fig. 3.—SIDE OF RASCHETTE FURNACE.

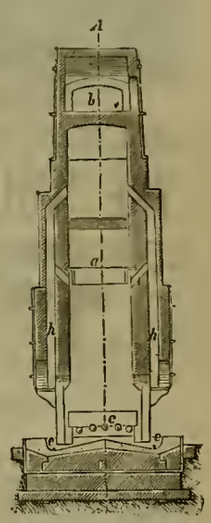


Fig. 4.—SECTION THROUGH WORKING DOORS.

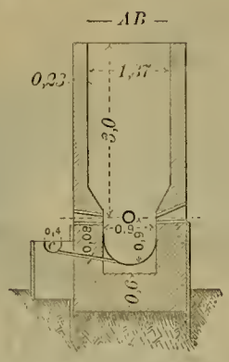


Fig. 5. SECTION THROUGH IMPROVED FURNACE.

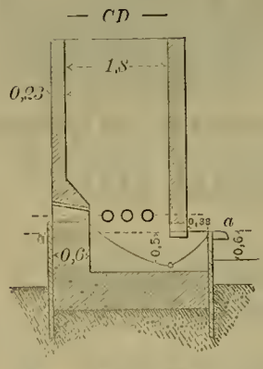


Fig. 6.—FROM FRONT TO REAR.

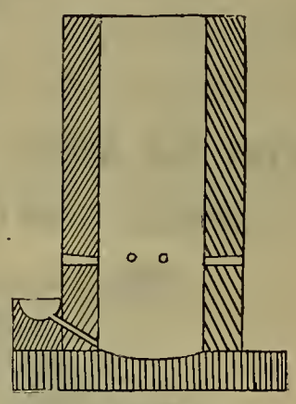
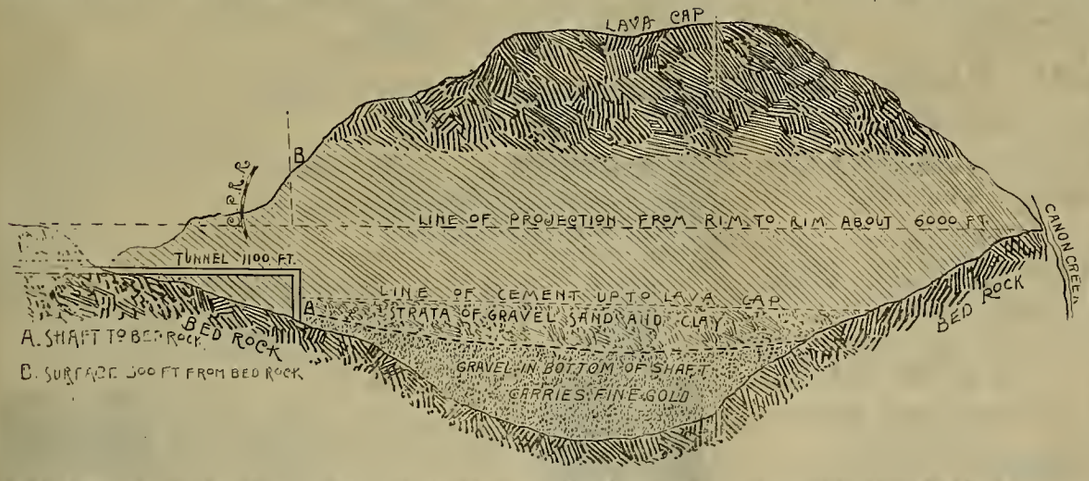


Fig. 7.—SIPHON TAP OR LEAD WELL.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B
LINE OF PROJECTION FROM RIM TO RIM ABOUT 6000 FT.
CANON CREEK
TUNNEL 1100 FT.
LINE OF CEMENT UP TO LAVA CAP
STRATA OF GRAVEL SAND AND CLAY
A
BED ROCK
BED ROCK
A. SHAFT TO BED ROCK
B. SURFACE 300 FT FROM BED ROCK
GRAVEL IN BOTTOM OF SHAFT
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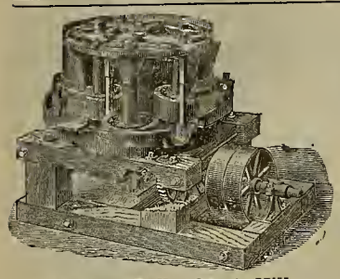
THE CONTROL OF THE COPPER MARKET.—Although the copper mines of Great Britain only produced the first half of the year 395 tons of fine copper, that country controls the copper trade of the world, and its markets establish the price. Great Britain consumed in the first half of this year 37,447 tons of copper, and has on hand now 38,524 tons. The imports into England the first half of this year amount to 66,199 tons of copper.

THE Winnemucca *Silver State* tells of a company of miners that failed in opening a mine at Unionville ten years ago. They assigned their claims and left the property. A few weeks ago the mine was sold to an English company, and the first use made of the money was to wipe out the old debt, although it was outlawed many years.

THE cruiser San Francisco logged 19 75 knots in her run of three hours under forced draft last Saturday. This is not as satisfactory a test as over a measured mile, but from her trials thus far it seems likely that the vessel will earn her builders a handsome premium for speed in excess of the guaranteed 19 knots.

ONE lumberman of Sierra valley, Cal., sold recently 600,000 feet of pine to a Salt Lake firm. It was shipped at Truckee.



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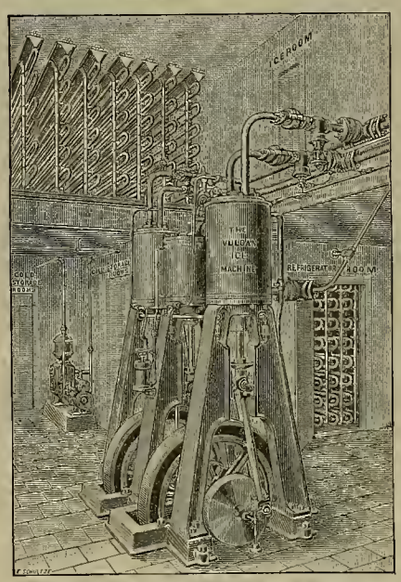

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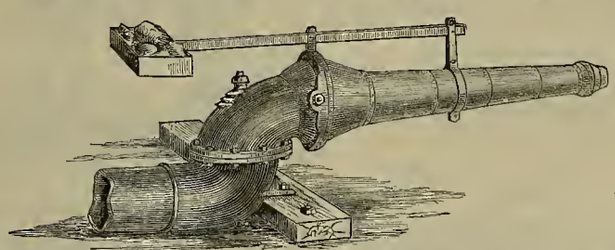

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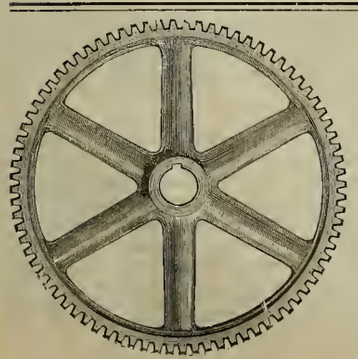

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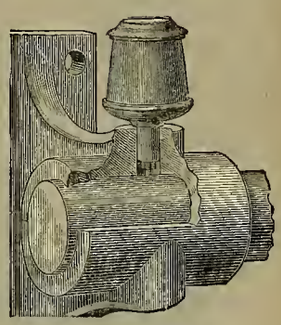

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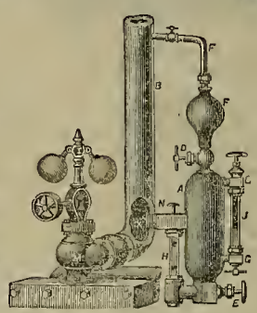

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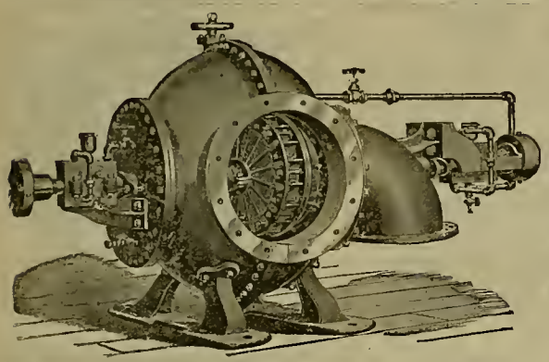

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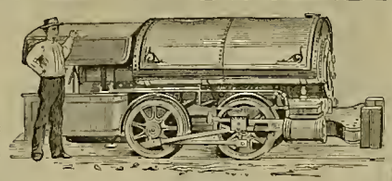

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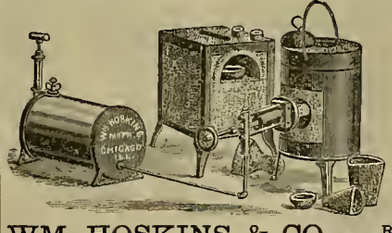

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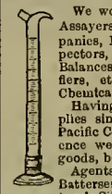

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I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.

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For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery, Iron, Steel, Copper, Brass. Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut or burred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

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JOHN W. QUICK, Proprietor.

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44 Third Street, · San Francisco, Cal.

This Fire proof Brick Building is centrally located, in the healthiest part of the city, only a half block from the Grand and Palace Hotels, and close to all Steamboat and Railroad Offices.

Laundry Free for the use of Families.

HOT AND COLD BATHS FREE.

Terms, Board and Room, $1.00 per Day And Upward.

Rooms with or without Board, Free Coach to the House,

J. POOLEY.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 21, 1890.

Geoeral trade the past week has been fairly active. The money market continues to show a fair degree of ease, with all legitimate requirements readily met by hanks and outside capitalists. The high prices of farm product and the advance in silver tend to the easy condition of the market.

MEXICAN DOLLARS—The market has beld stroog at higher prices. Sales are reported at 91¼c from first haods. Over the couoter, sales are made at 92@92½c.

SILVER—Under Mint purchases the price has advanced sharply. The couoter rate is $1.18½; while on direct selling offers over $1.20 was paid yesterday by the Department. All offers are now made to the Department at Washington direct. The prices paid on each huyiog day are giveo in the editorial department of to-day's paper. In this city over one-half of the holdings bave been placed. It is very generally conceded that the stock now on hand will soon be absorbed, when it is not at all unlikely that much higher prices will obtain. It is quite certain that in the Comstock mines gold will predominate as the work in tbem progresses. In Kentuck there is already showing oearly $8 of gold to $1 of silver. The Chinese demand for silver ought to begin to set in soon.

QUICKSILVER—Receipts the past week aggregate 210 flasks. Overland shipmeots in last month aggregate 125 flasks. The market is steady, with a fair demand ruliog.

BORAX—Receipts the past week aggregate 750 ctls., and exports by sea 26,705 pounds to Chicago, 115 pounds to Hooolulu and 600 pounds to Mexico. There was shipped overland in the past month 6580 ctls. The market is firm, with a good Eastern demand ruling.

LIME—Receipts the past week aggregate 4070 bbls. The shipping demaod is fair, while the home demaod shows an increase.

LEAD—The market is strong at unchanged quotations. The consumption on this coast is steadily iocreasing.

TIN—The spot market is barely steady, hut for shipment there is a strong tone. The lower outward freights from the supply market to this city is in shippers' favor.

COPPER—The market has held steady. It looks very much as if producers have determined to keep prices steady so as not to check tbe demand, which higher prices undoubtedly would do. The stocks the world over are being reduced.

COAL—Imports the past week aggregate as follows: Coos bay, 450; Seattle, 840; Tacoma, 4000; Nanaimo, 1300; Sydney, 3060; New Castle, N. S. W., 4390. Total, 13,640 tons. The market shows an advance in Australian, with still higher prices looked for. Although the tonnage to arrive is larger than at this time in 1889, yet it is all cared for, and it is upon this fact that large dealers base their bullish proclivities. Io coast coals the feeling is stronger. The consumptive demand is steadily increasing for all grades.

Eastern Metal Markets.

By Telegraph.

NEW YORK, August 20.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	51⅛	1 12⅞	$16 85	$4 55	$21 00
Friday	52	1 13⅛	16 85	4 60	20 95
Saturday	52⅛	1 16	16 85	4 60	21 00
Monday	54	1 17⅜	16 85	4 65	21 10
Tuesday	54	1 19⅛	16 80	4 62½	21 00
Wednesday	54	1 19	16 80	4 62½	21 25

NEW YORK, August 19.—The Borax stock is reduced. Higher grade California refined and powdered, 9@9½. Quicksilver steady, 74@76c. Copper quict: Lake nominally $17; Arizona, $15 50; casting, $14.50. About 700 tons Pig Lead taken at $4 53@4 62½ spot and near future; the latter price is for single cars.

San Francisco Metal Market.

WHOLESALE.

	THURSDAY, August 21, 1890.
ANTIMONY	22½@ —
BORAX—Refined, in carload lots	3 @ —
Powdered " " "	8 @ —
Concentrated " " "	7½@ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheathing	23 @ 25
Ingot, jobbing	24 @ —
do, wholesale	18 @ 18½
Fire Box Sheets	23 @ 25
LEAD—Pig	4½@ 5
Bar	5½@ —
Sheet	7 @ —
Pipe	6½@ —
Shot, discount 10% on 500 bags Drop, ₱ bag	1 75 @ —
Buck, ₱ bag	1 85 @ —
Oblided, do	2 05 @ —
QUICKSILVER—By the flask	57 00 @ —
Flasks, new	— @ —
Flasks, old	45 @ 55
TINPLATE—B. V., steel grade, 14x20, to arrive	— @ —
B. V., steel grade, 14x20, spot	— @ 4 80
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	6 00 @ —
do, do, 20x28	12 00 @ —
Pig tin, spot, ₱ lb	22 @ 22½
CHROME IRON ORE, ₱ ton	10 00 @ —
IRON—Bar, base	3 @ 3½
Norway, base	4½@ 5½
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —

IRON—Glengarnock ton	Spot. 34 00 @— —	To Load. 30 @ —
Eglinton, ton	34 00 @— —	30 @ —
American Soft, No. 1, ton	— @32 00	33 @ —
Oregon Pig, ton	— — @33 00	— @ —
Puget Sound	34 00 @— —	— @ —
Clay Lane White	— — @28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Bar Iron (base price) ₱ lb	— @ —	— @ —
Langloan	34 00 @— —	30 @ —
Thorncliffe	34 00 @— —	30 @ —
Gartsherrie	34 00 @— —	30 @ —
Barrow	34 00 @— —	30 @ —
Thomas	33 00 @— —	@ —
Cargotleet	30 00 @— —	26 @ —

A CYCLONE on Tuesday did great damage to a number of small towns around Wilkesbarre, Pa., and some 20 persons were killed.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ANVERTISSMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Almont M Co	Arizona	2.	1.	July 12	Aug 13	Aug 30	S Harman 302 Montgomery St
Bodie Cons M Co	California	12.	2.	June 16	July 22	Aug 22	B. L. Burling 329 Montgomery St
Bous Fors M Co	California	1.	5.	June 19	Aug 10	Sept 5	F. K Taylor 12 Montgomery St
Oons Imperial M Co	Nevada	28.	5.	July 17	Aug 20	Sept 11	C L McCoy 329 Pine St
Crescent M & M Co	California	4.	25.	Jun 24	Aug 2	Aug 29	J H Isbam 310 Pine St
Crocker M Co	Arizona	9.	15.	June 16	July 25	Aug 25	N T Messer 309 Montgomery St
Cruikshank G M Co	California	1.	10.	Jun 27	Aug 14	Aug 25	E J Koch 221 Sansome st
Exchequer M Co	Nevada	23.	25.	July 10	Aug 14	Sept 4	O E Elliott 309 Montgomery St
Gover M Co	California	2.	25.	July 15	Aug 20	Sept 6	Gray Dew 13 and 15 Fremont St
Gray Eagle M Co	California	18.	6.	July 1	Aug 4	Aug 25	J M Buffington 303 California St
Kentuck M Co	Nevada	22.	30.	Aug 18	Sept 22	Oct 14	J W Pew 310 Pine St
Locomotive M Co	Arizona	8.	5.	Aug 13	Sept 18	Oct 6	A H Fisb 309 Montgomery St
Mayflower Gravel M Co	California	48.	20.	Aug 5	Sept 6	Sept 29	J Morazio 328 Montgomery St
Occidental Cons M Co	Nevada	7.	28.	Aug 5	Sept 11	Oct 7	A K Durbrow 309 Montgomery St
Peer M Co	Arizona	9.	10.	Aug 7	Sept 12	Oct 3	N T Messer 309 Montgomery St
Peerless M Co	Arizona	15.	15.	Aug 14	Sept 23	Oct 14	A Waterman 309 Montgomery St
Tierakoff G M Co	California	4.	1.	June 9	July 26	Aug 23	W J Garnett 303 Pine St
True Cons M Co	California	9.	2.	May 26	July 21	Sept 15	J C Bates 434 California St
Union Cons M Co	Nevada	41.	28.	July 21	Aug 26	Sept 15	A W Barrows 303 California St
Utah Cons M Co	Nevada	10.	25.	Aug 5	Sept 15	Oct 2	A H Fish 309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Grand Prize M Co	Nevada	R Grayson	327 Pine St	Annual	Sept 16
Puget Sound Iron Co	Oregon	A Halsey	325 Montgomery St	Annual	Aug 28

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gato	309 Montgomery St	25	Apr 5
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	Jun 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Aug 11

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING July 31.		WEEK ENDING Aug. 7.		WEEK ENDING Aug. 14.		WEEK ENDING Aug. 21.	
Alpha	1.25	1.35	1.20	1.30	1.00	1.20	1.10	1.20
Alta	1.20	1.25	1.20	1.25	.95	1.05	1.05	1.15
Andes	.65	.70	.65	....	.50	.65	.50	.70
Belcher	2.50	3.30	3.10	3.45	2.70	3.15	2.80	3.10
Best & Belcher	3.75	3.90	3.05	3.55	2.75	3.10	2.85	3.15
Bullion	3.05	3.90	3.05	3.55	2.20	3.10	2.20	2.70
Bodie Con	1.15	1 25	1.20	1.30	.90	1.15	.95	1.30
Bulwer	.25	.30	.25	....	....	....	.20	.25
Commonwealth	3.25	3.50	3.00	3.45	2.95	3 05	2.50	2 70
Con. Va. & Cal	3.80	3.90	3.75	4.00	3.50	3 85	3.55	4.10
Onalleuge	2.75	3.15	2.35	2.85	1.90	2.25	2.05	2.20
Chollar	3 20	3.65	2.80	3.40	2.40	2.70	2.45	2.70
Confidence	6.87	....	6.00	6.12	5.00	5.75	5.00	....
Con. Imperial	.30	.40	.35	....	.30	.35	.30	.40
Caledonia	.40	.45	.40	....	.25	.40	.30	....
Crown Point	2.65	3 10	2.70	2.95	2.20	2.75	2.40	2.60
Crocker	.25	.30	.25	....	.25	....	.20	....
Del Monte	1.50	1.75	1 40	....	1.00	1.35	....	....
Eureka Con	3.75	4.25	4.15	....	3.95	4.25	4.00	4.25
Exchequer	.85	.90	.65	.85	.50	.80	.75	.95
Grand Prize	.50	.55	.25	.43	.25	.30	.30	....
Gould Curry	2 85	2.75	2.05	2.60	1.75	2.15	1.85	2 30
Hale & Norcross	2.60	2.8	2.55	2.75	2.05	2.60	2.15	2.60
Julia	.20	.25	.25	....	.15	.20	.20	.25
Justice	1.40	1.50	1.40	1.45	1.20	1.40	1.30	1.35
Kentuck	1.25	1.10	1.20	1.30	.85	1.05	.90	1.05
Lady Wash	.25	.35	.35	.50	.30	.35	.30	.35
Mono	.65	.75	.50	.70	.35	.40	.40	.40
Mexican	3.25	3.65	3.15	3.45	2.85	3.15	2.65	3.20
Navajo	.50	....	.50	....	....	....	....	....
North Belle Isle	1.30	....	1.15	....	1.01	....	1.05	....
Nev. Queen	.80	....	.75	.80	.60	.70	....	....
Occidental	1.20	1.35	.80	1.15	.75	.90	.80	.93
Ophir	4.70	5.62	4.75	5.50	4.35	4.85	4.50	4.70
Overman	2 45	2.55	2.00	2.40	1.35	2.05	1.90	2 20
Potosi	5.37	7.75	6.12	7.12	5.25	6.62	5.50	6.10
Peerless	.20	....	.20	....	.15	.20	.10	.15
Peer	.15	....	....	....	.10	....	.10	....
Savage	3.70	4.20	3.30	3.95	3.10	3.50	3.40	4.30
S. B. & M	1.65	1.80	1.40	1.75	1.05	1.25	1.20	1.30
Sierra Nevada	3.05	3.30	2.65	3.15	2.40	2.75	2.55	2.75
Silver Hill	.30	....	.25	.3	.20	.25	.25	.30
Scorpion	.25	....	.20	....	15	.20	....	....
Union Con	2.65	3.00	2.45	2.85	2.25	2.60	2.35	2.50
Utah	.9	1 00	.65	.90	.55	.65	.60	.65
Yellow Jacket	2.95	3.55	3 25	3.40	2.80	3.30	3.00	3.20

Sales at San Francisco Stock Exchange.

THURSDAY, Aug. 21, 9:30 A.M.

500	Julia	25c	
100	Andes	70c	
100	Belle Isle	95@1.00	
150	Bullion	2.50	
200	Caledonia	35c	
100	Challenge	2.20	
250	Chollar	2.70	
110	Con. Cal. & Va	4.05	
150	Con. Imperial	40c	
200	Exchequer	31c	
200	Hale & Nor	2.45	
100	Kentuck	90@95c	
100	Ophir	4.80	
400	Peer	10c	
550	Peerless	10c	
100	Potosi	6.25	
450	Savage	3.95@4.00	
100	Sierra Nevada	2.65	
100	Utah	65c	
200	West Comstock	50c	
100	Yellow Jacket	3.15	

Coal.

TO LOAD.	Per Ton.	SPOT FROM YARD.	Per Ton.
Australian	$ 5 00@$5 50	Wellington	$ 9 00
Liverpool Steam	8 00@ 8 25	Greta	9 00 @10 00
Scotch Splint	8 25@ 8 50	Westminster Brymbo	9 00
Cardiff	8 50@— —	Nanaimo	9 00
Lehigh Lump	16 50@17 00	Sydney	9 50 @10 00
Cumberland bk	13 50@— —	Gilman	5 50
Egg, hard	15 00@— —	Seattle	6 50
CANADIAN ANTHRACITE COAL.		Coos Bay	6 00
Egg, ship side	$12 50	Cannel	12 00
Egg, yard	15 00	Egg, hard	16 00
Nut, yard	15 00	Cumberland, in sacks	16 00
Stove, yard	15 00	do, bulk	15 00
Nut, yard	15 00	Wallsend	9 00@ 9 50
CORE.			
English, to load	$12 00@13 00		
English, spot, in bulk	13 50@15 00		

PATENTS FOR SALE —Mr. John F. Tilton of this city has for sale the patent right to several of his inventions. He has a patent on a safety attachment for car stoves. By this device the fire in the car stove is extinguished in case the car is thrown over an embankment or otherwise capsized. His patent sewer gas trap is intended to cut off the communication between sinks or hoppers and the sewer. This device is a simple one and not expensive. Another patent is a faucet for shipping and service-cans such as are used for oil, etc. This also is a simple and ingenious appliance adapted for oans or barrels so that the contents can be readily drawn in qnantities to suit from the original package. Mr. Tilton desires to sell each of these patents at prices from $500 to $1000. Information concerning them can be had at this office or from Mr. Tilton at No. 221 Elm avenue. The devices covered by the patents are of that character which come into common use when properly introduced to the public.

EIGHTEEN persons were killed and 30 injured in a railroad accident on Tuesday at Quinoy, on the Old Colony road, near Boston.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not koowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

HANFORD has another artesian well connected with its city water supply. A good flow was struck at 500 feet.

Assessment Notices.

GOVER MINING COMPANY—LOCATION of principal place of business, San Francisco, California. Location of works, near Drytown, Amador county, California.

Notice is hereby given that at a meeting of the Board of Directors held on the 14th day of July, 1890, an assessment (No. 2) of twenty-five cents (25c) per share was levied upon the capital stock of the Corporation, payable immediately to the Secretary, at the office of the Company, 13 and 15 Fremont street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Wednesday, the 20th day of August, 1890, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 6th day of September, 1890, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

GRAY DEW, Secretary.

Office, 13 and 15 Fremont St., San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 18) levied on the first day of July, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Bogart, O H, Trustee	423	350	$ 21 00
" " "	424	650	39 00
" " "	447	5,000	300 00
" " "	488	105	6 30
Barrows, A W, Trustee	537	2-4	17 04
Bowers, D	379	20	1 20
" "	404	500	30 00
Buffington, J M, Trustee	527	2,500	150 00
" " "	528	2,000	120 00
Francis, H L, Trustee	444	1,500	90 00
Nash, H W	269	104	6 24
Nordman, Leon	514	100	6 00
Stout, C S, Trustee	476	2,000	120 00
Searles, W A, Trustee	518	1,000	60 00
" " "	519	606	36 36
Stetson, A M, Trustee	520	5,000	300 00
Taylor, J M, Trustee	532	1,040	62 40
Wetzel, Theo, Trustee	215	50	3 00

And in accordance with law, and an order of the Board of Directors, made on the first day of July, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on MONDAY, the 25th day of August, 1890, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California street, San Francisco, California.

DELINQUENT NOTICE.

GOVER MINING COMPANY—LOCATION of principal place of business, City and County of San Francisco, California; location of works, near Drytown, Amador county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 2) levied on the 14th day of July, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Wheeler, W A	53	1,100	275 00
Pratt, Freeman	95	50	12 50
Small, John C	96	1,066	266 50
Trefethen, George	99	500	125 00
Sanborn, Helen P	101	250	62 50
Tyler, S C	102	200	50 00
Parsons, C A	103	200	50 00
Stone, N I	142	3,000	750 00
" "	155	2,000	500 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of July, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Nos. 13 and 15 Fremont street, San Francisco, California, on SATURDAY, the 6th day of September, 1890, at the hour of one o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

GRAY DEW, Secretary.

Office, 13 and 15 Fremont street, San Francisco, California.

CERTIFICATE OF PARTNERSHIP.

We certify that we constitute a partnership transacting business in the City and County of San Francisco, State of California, and in this State. Its principal place of business is at San Francisco, California. The name is CONNOR & GRANT. The full names and respective places of residence of all its members are signed hereto, and the said copartnership to commence June 1st, 1890.

SAMUEL B. CONNOR, San Francisco, Cal.
ANDREW S. GRANT, San Francisco, Cal.

STATE OF CALIFORNIA, } ss.
City and County of San Francisco, }

On this 12th day of July, in the year one thousand eight hundred and ninety, before me, Geo. T. Knox, a Notary Public in and for the City and County of San Francisco, personally appeared Samuel B. Connor, of said City and County and State, and Andrew S. Grant of the same place, each personally known to me to be the persons whose names are subscribed to, and who executed the within instrument, and they acknowledge to me that they executed the same.

In witness whereof, I have hereunto set my hand, and affixed my Official Seal, at my office, in the City and County of San Francisco, the day and year in this certificate first above written.

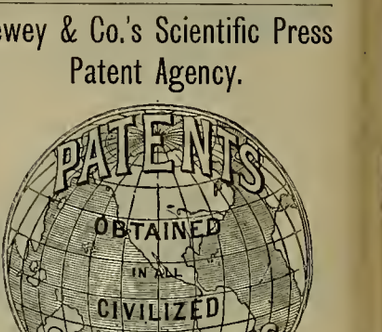
[NOTARIAL SEAL.] GEO. T. KNOX, Notary Public.

EVERETTE'S MINING OFFICE.

Pioneer Mining Office of the Northwest Coast.

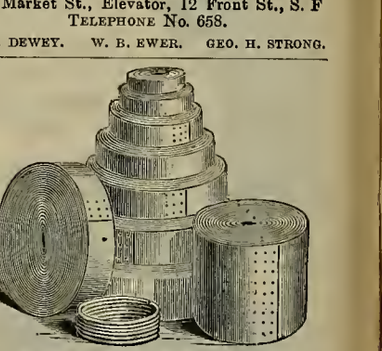
Having the largest permanent brick assay furnaces, chemical laboratory and mining office on the Northwest Coast, with a collection of about 4000 samples of the ores of Alaska, British Columbia, Oregon and the Northwest Territories; and having made personal examinations of nearly every mining camp on the Pacific Slope, from California to Alaska, I am prepared to do any class of legitimate and honest mining work, such as EXAMINING, ENGINEERING, SAMPLING AND REPORTING ON THE VALUE OF ALL MINERAL, COAL AND FIRE-CLAY PROPERTIES, BUILDING STONES, EARTHS, ASSAYS AND ANALYSIS OF ORES, WATERS, CHECK SAMPLES OF ORE, PULPS, "ORGANIC ANALYSIS" WORK, and in fact any work connected with the office of a first-class mining geologist and chemist. Any information mining men may desire to know relative to the MINERAL OR COAL RESOURCES of the entire Pacific Northwest will be honestly given. Address **Dr. Willis E. Everette**, Consulting Mining Geologist and Chemist, 1318 E Street, Tacoma, Wash.

Dewey & Co.'s Scientific Press Patent Agency.



OUR U. S. AND FOREIGN PATENT AGENCY presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library, containing official American and foreign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the MINING AND SCIENTIFIC PRESS. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free.

DEWEY & CO., Patent Agents,
220 Market St., Elevator, 12 Front St., S. F
TELEPHONE No. 658.
A. T. DEWEY. W. B. EWER. GEO. H. STRONG.



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(Successor to Heins & William,)
Manufacturer of Leather and Fulled Rawhide BELTING, Rope, Lace and Pump Leather, Etc.
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Contractors for Prospecting
With Diamond Core Drill for Mineral, Oil, or Water, or for Boring Holes for Drainage, Etc.
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218 Sansome Street, San Francisco, Cal.

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The Evans School
OF
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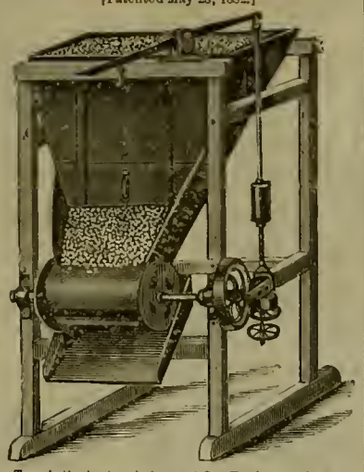

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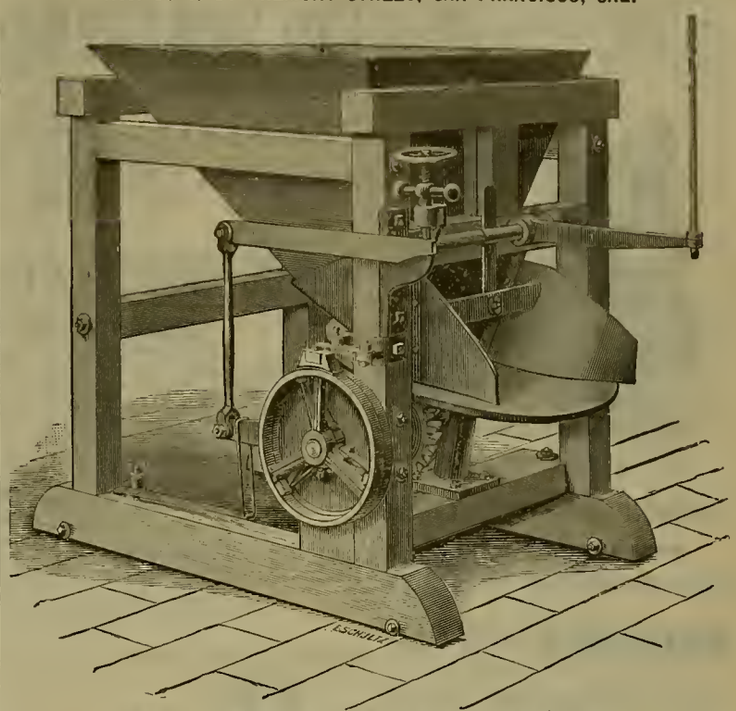

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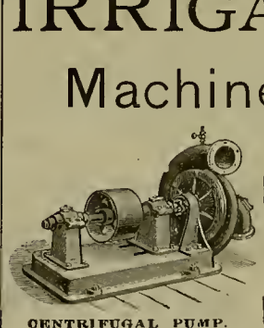

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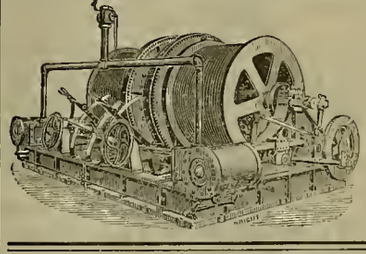

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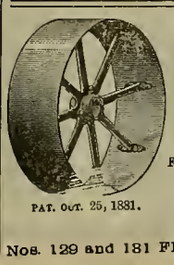

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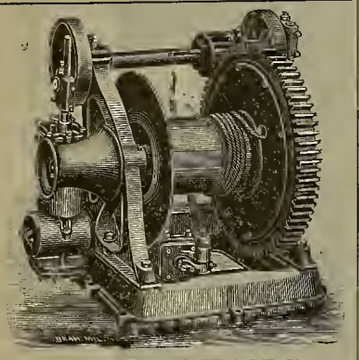

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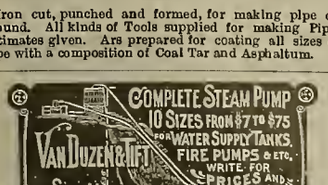

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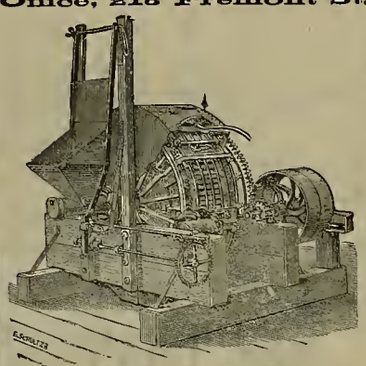

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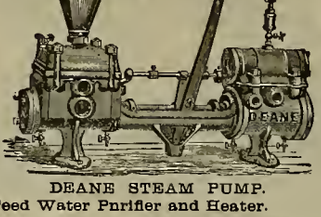

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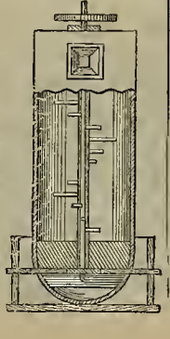

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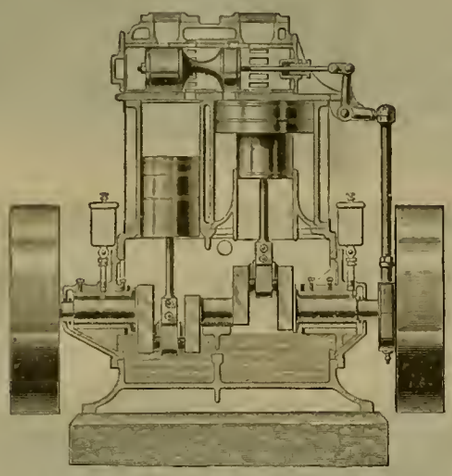

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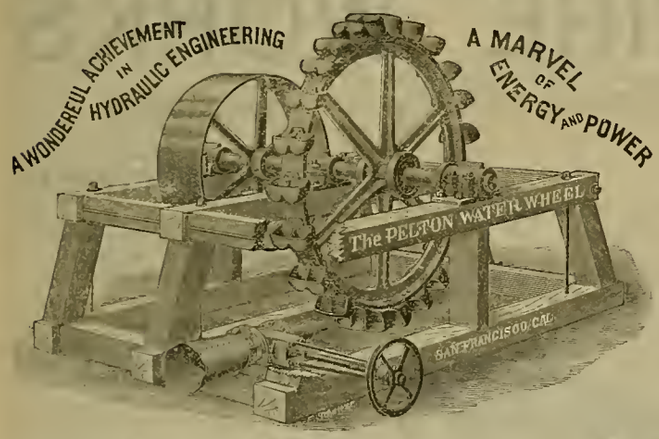
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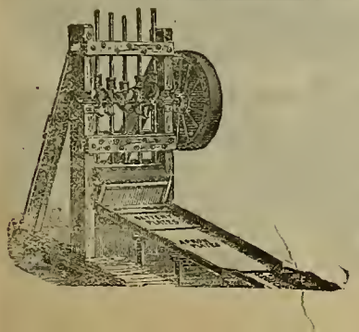

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SILVER-PLATED AMALGAM PLATES for SAVING GOLD

IN QUARTZ, GRAVEL AND PLACER MINING.

PRICES GREATLY REDUCED.

Only Refined Silver and Best Copper used. Over 3000 Orders filled. Fifteen Medals Awarded. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated.

These Plates can also be purchased of JOHN TAYLOR & CO., Corner First and Mission Sts

San Francisco Gold, Silver and Nickel Plating Works, 653 & 655 Mission St., San Francisco, Cal., E. G. Denniston, Prop'r.

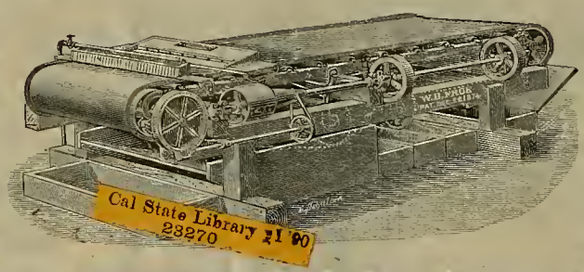
Our Platee have heen ueed for 20 yeare. They have proved the heet. We adhere etrictly to contract in weight of Silver and Copper. SEND FOR CIRCULAR.

IMPROVED BELT FRUE ORE CONCENTRATOR.

The Best Ore Concentrator In the market, having douhle the Capaoity and doing its work as olose as the plain Belt machine, while its concentrations are clean. It is nsed in a numher of Mills, the most notahle of which is the Alaska M. & M. Co's Mill, where 24 Improved Belt Frues are taking the Pulp from 120 Stamps, orushing 350 tons per day, and is giving entire satisfaction as against 48 plain Belt Machines, taking the Pulp from the other 120 Stamps.

Price of Improved Belt Frue Vanner, $825, f. o. b.
Price of Plain Belt Frue Vanner, $575, f. o. b.

For Pamphlets, Testimonials and further information apply at office.



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Protected hy Patents Decemher 22, 1874; Septemher 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; Septemher 18, 1883; Jnly 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

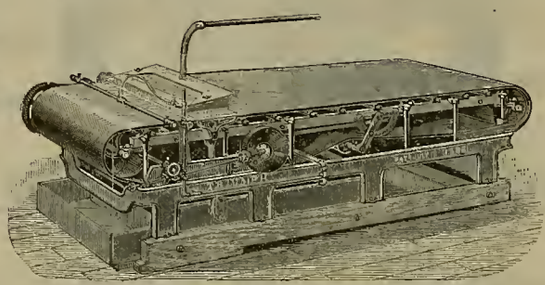
ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held hetween the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the hest ore oonoentrator in the market. The fact that the "Frues" have improved (corrugated) helts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can he mounted with a superior helt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need he.
Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected hy inoontestable letters patent, granted hy the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

CALIFORNIA WIRE WORKS

ESTABLISHED 1852. INCORPORATED 1882.

—MANUFACTURERS OF—

Steel Wire Rope,

—OF ALL KINDS FOR—

CABLE RAILWAYS,
ROPEWAYS and TRAMWAYS,
Mining, Shipping & General Purposes.

WIRE,
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Full Assortment Always in Stock.

OFFICE:
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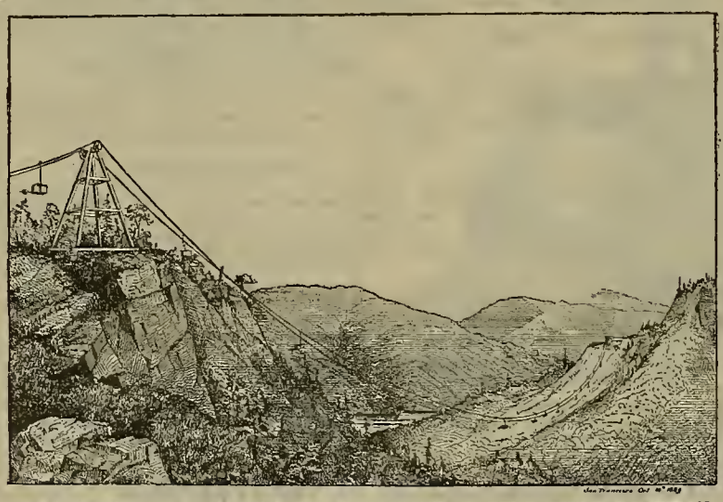


TRANSPORTATION OF ORE BY HALLIDIE'S PATENT WIRE ROPEWAY.

HALLIDIE'S

PATENT WIRE ROPEWAY,

For the Economical and Rapid Transportation of Ore and other material.

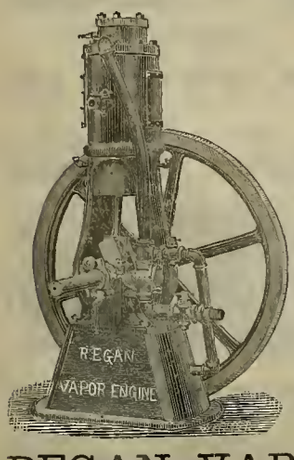
Erected by Us During the Past Fourteen Years in Spans of

200 TO 2,000 FEET.

Simple, Economical and Durable.

HAVE BEEN THOROUGHLY TESTED In all Parts of the Country.

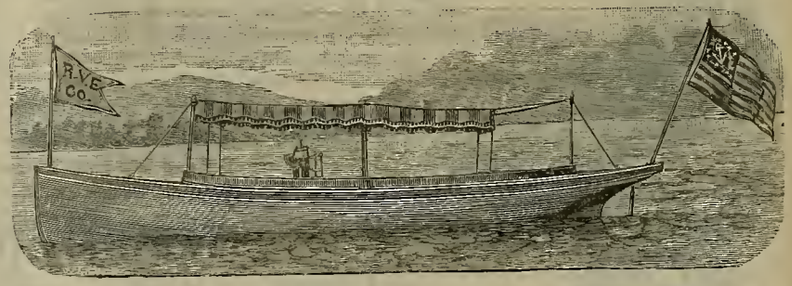
REGAN VAPOR ENGINE.



NO BOILER! NO FIRE! NO STEAM!
Simple, Compact and Cheap.
No Fire or Flame. Started Instantly without Even a Match.
No Ashes! No Explosion! No Engineer!
FULL POWER OBTAINED IMMEDIATELY.
The Moment Engine Ceases to Run, all Expense Stops.
NO DANGER.
Horizontal, Upright and Marine Vapor Engines and Launches.
Three fourths to Fifteen Horsepower.
From $175 to $1200.
Send for Our Large Illustrated Catalogue.

GEORGE HAAS, 824 Market St., Phelan Building, }
SAN FRANCISCO, Feb. 21, 1890. }

REGAN VAPOR ENGINE CO.—Gentlemen: The 2 H. P. Engine you put up in our factory last November, has given satisfaction beyond my expectations. It do s my work better than than those two Electric Motors did, with scarcely any expense for gas. I paid the Motor Company $25 per month for power, while the Vapor Engine has cost me but $2 per month so far. But, be it understood, I have not used the Engine as much as in summer, but the cost of motor would have been all the same, making a saving of $69 in three months. I am satisfied the Engine will pay for itself in less than two years. I use it for freezing cream, run three fans, cocoanut grater, etc.
Yours truly, GEO. HAAS.



Regan Vapor Launches

The uses for small steamboats and launches are innumerable; they are convenient and serviceable for transportation, and are a source of pleasure for those who are fond of sailing. But many have been deterred from purchasing such boats, because of the trouble and inconvenience of using coal, and the necessity of obtaining a Government license, engineer, etc. Our motor does away with these objections. The small space taken up by our engine in the boat gives more room; the boat will seat twice as many persons as one the same size fitted up with a steam engine. It takes only two minutes to get under headway, and can be stopped when running at full speed within the length of the boat, the reverse motion being instantaneous and effective. We carry in stock six regular sizes of hulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos. Kane & Co., Racine, Wis.

REGAN VAPOR ENGINE CO., 221-223 First St., San Francisco, Cal.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 9.
DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 30, 1890.

Three Dollars per Annum.
Single Copies, 10 Cts.

New Field Locomotive.

It looks as if we were about to make important changes in our mechanical appliances and methods of farming in this State. The field locomotive, pulling its quota of 10, 12 or more plows, and turning over 25, 30, and even 40 acres per day, at a cost of about 50 cents per acre, is becoming too common to excite special attention. Not only is the plowing done by steam, but the harvesting, and, in some cases, the hauling as well.

Just what a saving of one-half or so in the cost of raising wheat means to the industries of this State is something hard to realize.

Among the latest machines for this purpose is the new field locomotive of Jacob Price, illustrated on this page. It is said that this machine pulled, near San Leandro, one day last week, an outfit of twelve 11-inch plows in a dry, adobe soil, traveling at the rate of over four miles per hour in doing so, and maintaining the steam pressure at 130 pounds, without difficulty.

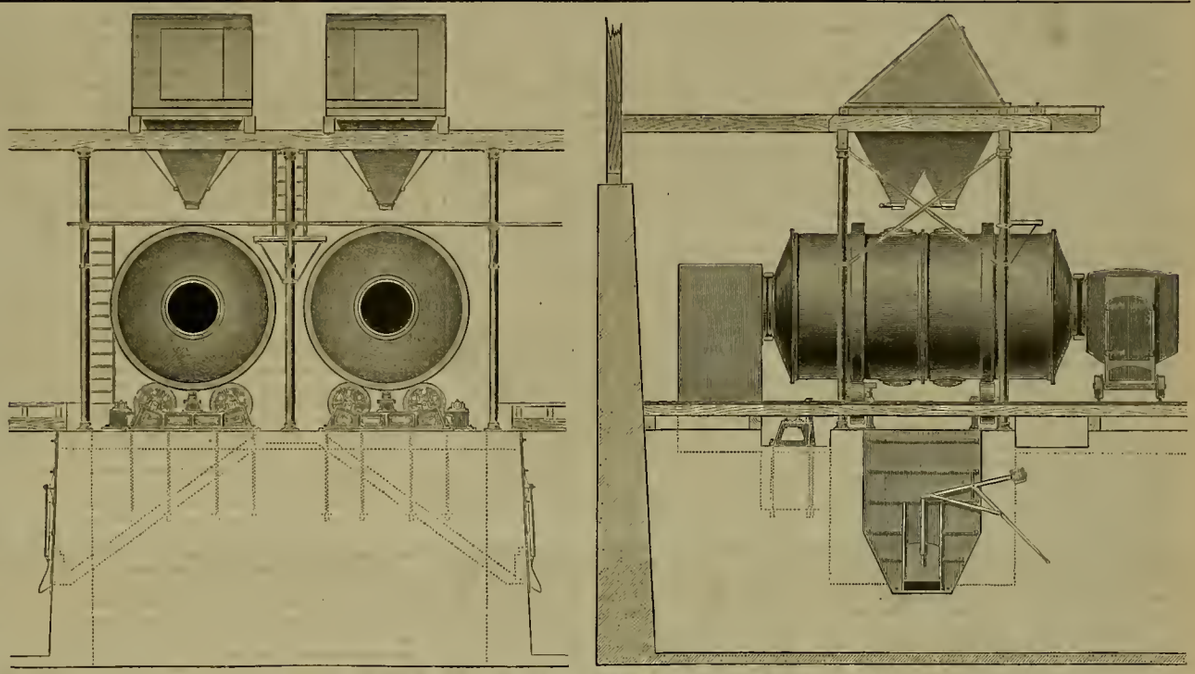
A number of farmers were present, who agreed that to pull one of the 12 plows in that soil, hard as it was, would have required at least four horses, or 48 for the 12. As the locomotive pulled them at fully twice the speed of horses, it follows that the machine was actually doing the work of nearly 100 horses, a thing that seems incredible for a machine weighing less than nine tons.

The exhibition was made to satisfy the agent of a bank in this city, who had been examining various steam-plowing outfits with a view to purchasing one, to be used on lands owned by the bank. At the conclusion of the trial, the sale was made and a portion of the purchase-money paid.

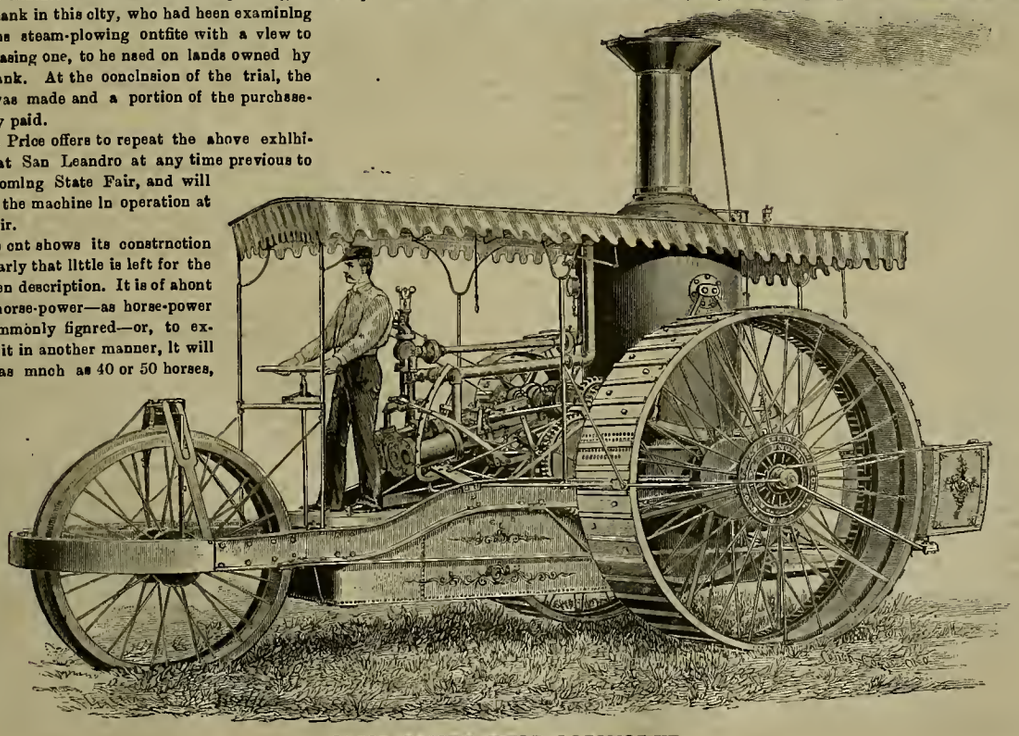
Mr. Price offers to repeat the above exhibition at San Leandro at any time previous to the coming State Fair, and will have the machine in operation at the fair.

The cut shows its construction so clearly that little is left for the written description. It is of about 100 horse-power—as horse-power is commonly figured—or, to express it in another manner, it will pull as much as 40 or 50 horses, besides propelling itself. Its weight is only 8½ tons. The carrying wheels are about eight feet high and 26 inches wide. The steering wheel is five feet high and 14 inches wide. The boiler is an enlarged fire-engine boiler of the most approved type, and is made strong enough to carry 200 pounds working pressure with safety. Its fire surface is 200 feet and its other heating surface (flues) 200 more, making a total heating surface of 400 feet. The main gears are steel rollers working on oiled steel pins, and the remainder are made from metal patterns cut by the celebrated gear-makers, Brown & Sharp, of Providence, Rhode Island.

The entire machine is mounted on long, easy, elliptic springs, in a manner that utterly obviates any interference with the working of the gears, a result, according to Mr. Price, never accomplished before. The machine has twin engines, piston valves and link motion. It is adapted for plowing, running combined harvesters, freighting with wagons, hauling saw logs, or pulling of almost any kind, and is suitable for any stationary work such as running thrashing machines, sawmills, etc. It is made in two sizes, the larger one being as shown and described above and the smaller of about half its weight and power. Its appearance, as is evident from the cut, is much in its favor, being very compact and neat as well as convenient in the matter of throttle and reversing levers and steering gear. It is almost wholly of forged steel, and was made at the works of the J. I. Case Thrashing Machine Company, Racine, Wisconsin, by Jacob Price of San Leandro, California, and also of Racine, Wisconsin.



THE IMPROVED BRUCKNER ORE-ROASTING CYLINDER—See page 142.



JACOB PRICE'S FIELD LOCOMOTIVE.

Mechanics' Fair.—Applications for space at the coming Mechanics' Fair are being daily made. A double engine and large vacuum pump have been loaned by the California-street Railway Co., and will be placed on exhibition by C. H. Evans & Co., builders. Foundations for two large additional engines are now being constructed. Forty feet square has been applied for in which to manufacture rubber goods. The directors have asked A. S. Hallidie to place on exhibition the original models, material and appliances appertaining to the cable railway system, and also statistics of the application and growth of the system.

The suit of Charles W. Hendel to recover $15,890 from B. F. Baker, involving the Pioneer Mining Company, has been transferred for trial from Sierra county to Alameda county.

George B. Walker, a California pioneer and well known as a promoter of mines, died this week in New York.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Anaconda Mine.

Description of an Immense Property.

EDITORS PRESS:—This now justly celebrated copper mine was located by Hickey Bros. in 1876. Some time after its location they gave Chas. X. Larrabie one-half to sink a shaft 50 feet on the vein. Then afterward Marcus Daly acquired one-third of the mine for doing some further development, and it did not attract much attention for several years. In November, 1880, Mr. Daly bonded the other two interests for $10,000 each, and went to work to thoroughly satisfy himself as to the worth of the mine, which thus far had been considered a silver prospect, and I have been informed that after the property was merged into the Anaconda Co., the first plant that was ordered for the property by that company was a complete dry-crushing silver-mill; but before they had it placed, the sinking ran into copper ore and they abandoned the silver idea.

The large three-compartment shaft was sunk to the 1000 foot level and stations out; crosscuts and levels run at each 100 feet, and a locality for a large reduction works was sought. The nearest point that was feasible was selected on Warm Springs creek, 22 miles southwest of Butte, and what was at that time considered a monster plant was placed with a capacity for handling 1200 tons daily. It was but a short time until the development of the mine showed such enormous ore reserves that they decided to increase their capacity to sufficient size to work 3000 tons daily. This was all decided and the preliminary work begun before the Secretan and his French syndicate began the boiling of the price of copper, which was then below 10 cents—a proof that the price of the red metal cut no figure with the capitalists who are behind the enterprise.

Their immense new smelter was about completed when a fire took place and the whole plant was consumed. What would have swamped an ordinary mining company was not considered by these gentlemen. They at once began to clear away the debris and place orders for the iron, and the smelter at Carroll is again in complete running order, and is now fire-proof, being wholly constructed of iron.

The old or upper works are now being gradually torn out and rebuilt of iron. When they are completed, the Anaconda will have the most extensive and the best constructed reduction works in the world. The question of cost has never been considered. When any machinery is placed, the only query is, Will it do the work, and will it give us better results at a lower cost of handling our immense output? If it will do this, they want it, whatever it may be, and in carload lots.

Large Operations.

The magnitude of this company's operations can scarcely be conceived by parties who are unfamiliar with large workings. Their shipments of copper during the past year amounted to over 30,000 tons. The estimate of the amount of silver in this is nearly 2 000,000 ounces, and the appreciated prices of this year will largely swell the gross product of the company.

The company have expended in development, purchasing mines and in their plant since November, 1880, to Jan. 1, 1890, over $24 000,000. It almost takes a man's breath away to think of the amount, but when the fact is considered that they use 75,000 tons of coal and a like number of cords of wood and 15,000,000 feet of lumber during a year, and that the railroads receive from the Anaconda Company in the vicinity of $1,000,000, the sum total is not so surprising.

Mine Development.

The Anaconda and St. Lawrence have not yet recovered their places as ore-producers since the fire of November, 1889, but by Sept. 1st everything will be in shipshape order. During all the time since the fire occurred they have kept their shipments up to about 1800 tons daily by increasing the output of the Chambers Syndicate mines, consisting of the Wake-up Jim, Wild Bill, Modoc, High Ore, Bell, Mountain Consolidated and Buffalo Diamond. These have all been developed from 500 to 1000 feet in depth and stations cut with crosscuts to the leads, levels run, man-holes put in, and everything is shaped up for extraction of ore whenever wanted in quantities to suit the requirements of their reduction facilities.

The Town Built Up

In the vicinity of the smelting works is a lively city of nearly 7000 people and sports all the modern improvements of the day—fine water works, lighted by electric lights, and the finest hotel building in Montana. There is nothing to compare with it between St. Paul and Portland.

The General Manager

And prime mover in this gigantic enterprise is Marcus Daly, who came into Butte with the second emigration or rather during the quartz excitement. For a time he operated in the interest of the Walker Bros., and during this time opened up the Alice mine and built the plant now crushing ore on that property. Becoming dissatisfied, he sold his stock in that company, resigned his position as superintendent and struck out to find a better thing as the saying goes, and he has certainly been successful in the superlative degree. He has looked after the company's many interests since that time in a most satisfactory manner. He has found time to improve an elegant home in Bitter Root valley, and has stocked his ranch with some of the finest horses in the land. Mr. Daly is certainly possessed of wonderful executive ability to be able to direct the development of the large group of mines and build the enormous plant now in operation by the company. It is fair to presume that a portion of his success may be attributed to his discernment in selecting his lieutenants, as but few changes occur in his official family. Mike Carroll went to work with him on the shaft that was sunk under the bond from Hickey & Larrabie, and he is still mining superintendent, and there are not many nooks and corners in the properties that Carroll is not familiar with.

The company has directly in its employ at the mines and smelters about 3000 men, and indirectly nearly as many more gain a livelihood, making it a heavy contributor to the general prosperity of the new State of Montana.

The Future Development

Of the properties is full of possibilities, but of ore reserves that are already open and capable of being measured up, they have many years' work in sight. The lead on the 1000-foot level is 21 sets of timber wide, all of which is mined and sent to the works at Anaconda. This will show what a mountain of ore they have to draw upon for their future supplies.

Rumors have been circulated at times during the past 12 months that an English syndicate was negotiating for the Anaconda properties, but no evidence can be obtained on the subject that can be considered authentic. The work of improving and completing their operations is carried on with the same vim and activity that has characterized their work from the beginning, and, to the general observer, would give the idea that they were preparing to produce copper and silver by the carload for the next century.

The management of the Anaconda Company are always on the alert for new properties, and when a new camp starts up, either in Montana or Idaho, they are sure to have representatives on the ground to look the field over, and if it promises well for the future, they will have bonds on a number of the prospects and always push the prospecting of a new camp along rapidly. They have ample means to put in machinery, and arrive at results in a few months that the original locators might struggle with for years and then have to forfeit their rights. They frequently have differences and troubles with the railroads on the matter of keeping up their supplies, and at one time it was thought that company would build and operate their own road from the mines to the reduction works. When the railroads see that they are taking chances of losing their best patron, they always come to time, and all goes serene for a time. The visitor who passes through Butte without taking a drive around and seeing the number of properties of the Anaconda Co., and the magnitude of their operations, and their concentrating, milling and smelting plant, has not seen the most interesting portion of a trip to Butte.

It is particularly unfortunate that it is necessary to keep the works so closely guarded, but it is, I presume, one of the necessities when such extensive operations are carried on to have none on the grounds except those who have business there, as persons going to and fro indiscriminately cause employes to neglect their duties while asking questions, and their only protection is to exclude them without fear or favor.

Refining Works.

The company has secured title to a large quantity of land at Three Forks, 70 miles east of Butte, with unlimited water-power, and it is said to be their intention to add a very extensive refining works, which, of course, will make a heavy reduction in their freight, as they ship their matte at about 65 per cent now, and the item of 35 per cent of a yearly output of over 30,000 tons is a large item of expense, and if they can refine it here, it will be another pay-roll in the interest of Montana. Each addition of this kind means continued prosperity assured.

The wants of the company in the way of general supplies for current use at the mines and works are purchased and distributed by the Butte Trading Company, a corporation within the Anaconda Co. Their volume of trade must be enormous, judging from the number of carloads of goods unloaded at their warerooms. The Montana Union switches are run into the hoisting works in order to deliver lumber and other heavy materials convenient for handling, and many thousand feet of lumber are kept on hand in reserve, in case of the railroad being blockaded or stopped from other causes. This description of the Anaconda mine and plant is rambling, but will serve to give the readers of the PRESS some idea of its vastness. The company being a close corporation, the best facilities are not furnished for writing the mine up in detail, and your correspondent has had to depend on many different sources for what information has been furnished. R. G. H.

Butte, Montana.

Copper in British Columbia.

EDITORS PRESS:—Prospecting work on the Victoria Copper Mining Claim has been in progress the last two months. This claim was located in 1889 by parties from Spokane Falls, Washington. The lode is six inches to three feet in width. The solid copper ore lays in deposits or chutes. The average assay is 60 per cent copper per ton; selected assay 65 to 75 per cent; also carries some gold and silver. The formations are syenite and granite. A shaft is being sunk on the ore chute, and at present depth the chute is increasing in size and quality of ore. The lode dips into the mountain at an angle of 45 degrees, and runs north and south. Solid pieces of copper weighing 100 pounds have been taken out near the surface. The intentions are to develop the claim thoroughly. C. BECKINGER.

South Fork of the Similkameen River, B. C.

Clarifying Water from Streams and Ditches.

EDITORS PRESS:—In a recent number of the PRESS the difficulties encountered in securing pure water, and the methods employed by the leading water companies, was ably written up and illustrated. This same difficulty was met and overcome by the miners of '49, and their experience may help to solve the problem of how to obtain pure water. The miner used the water in the mountain section where storms were frequent and severe; in consequence the wash from the hillsides and gulches soon filled his reservoirs and ditches. As a rule he was compelled to use water that carried all the tailings from a mine farther up the stream, and this had to be disposed of before it could be turned into another ditch. The '49er proved himself equal to the emergency in this as in everything else. Dams built across the ravines impounded the wash coming down from above. Headgates placed at different levels allowed the drawing off of clear water from the reservoirs. Where the sand filled into the ditches badly a slot was cut across the flume and a 2x4 placed back of it. Through this slot the sand dropped, and thus left the ditch free from accumulating sands where the mud or slickens was held in solution. Slum-boxes were built at the side of the ditch. The water, by means of gates, was turned into these slum-boxes, and at the lower end of the box turned out by another gate into the ditch. These boxes were about three feet lower than the bed of the ditch, and so acted as settling tanks. When nearly full the upper gate, which turned the water into the slum-box, was taken out of the flume and placed across the entrance to the slum-box; then a gate at the lower side of the slum box was opened and the slum either shoveled out or a stream of water was turned in sufficient to wash it out. These slum-boxes could be built in succession and the water settled until it was as clear as desired.

When in Dakota, in '80, the superintendent of the Homestake mine used the water appropriated by another, and although he restored it to the same stream, was sued for damages for fouling the water. He put in a series of slum-boxes, and when the case came up for trial, placed on exhibition a bottle of water taken from the stream at the point where his ditch diverted the water, and another bottle of water from the stream below where he discharged it from his slum-boxes. The court found that the water had been purified instead of befouled, as it was cleaner after than before using.

Murphys, Cal. E. H. SCHAEFFLE.

THE OPHIR.—The Ophir Mining Company shipped by the Virginia & Truckee railroad express train through Wells, Fargo & Co. last evening six bars of bullion valued at about $25,000, without the discount on silver deducted. Gold predominated over the white metal in the bars. This bullion is the returns from 883 tons and 1630 pounds of ore shipped to the Morgan mill and extracted from the Ophir mine in advancing the upraise above the 1465 level and following the ore developed there north and south, and in prosecuting explorations on the 1465 level. The returns show an average bullion yield of nearly $29 per ton. None of the ore developed in the winze below the 1300 level has yet been shipped; that extracted in exploring the extent of the development is temporarily stored on the 1400 level of the mine. The Ophir Mining Company since its incorporation has disbursed to shareholders $1 595,800 in dividends. The last paid was $1 per share, declared Jan. 12, 1880, out of ore extracted from the Hardy vein. The assessments levied by the company to date aggregate $4.210,640. The financial statement filed Aug. 1, 1890, showed a balance of $23 505.11 in the company's treasury on that date, which, added to the bullion shipment made last evening, makes a total of about $45,000 in the treasury, with the discount on silver deducted. Should further explorations demonstrate that the new ore development in the mine is as valuable as it promises to prove, another dividend at an early date is among the probabilities.—*Virginia Chronicle.*

RIVER MINING.—Says the Grass Valley *Tidings:* A young man who is engaged in river mining in the Yuba, working with a rocker, has averaged $6 35 in gold per day. An expert Indian, also with a rocker, has taken out as high as $16 a day. Next summer will see very active work in this line, and some big cleanups will be heard of. The amount of gold in the Yuba and its tributaries, washed down from the hydraulic mines, cannot be estimated, but it is known to be very large.

San Bernardino County.

Its Mineral and Other Resources.

NUMBER VIII.

[Written for the PRESS by JAMES H. CROSSMAN.]

Other Springs

In addition to those springs mentioned in my article of last week, the following are important as being situated on traveled routes or trails leading to the several mining districts. These are all in San Bernardino meridian except those otherwise indicated:

Black's Ranch Spring, Tp. 11 N., R. 3 W.
Dry Lake Spring, Tp. 11 N., R. 4 W.
Cottonwood Springs, situated in Tp. 9 N., R. 15 E.
Bonanza Springs, situated in Tp. 7 N., R. 16 E.
Chimehuevis Valley, on which occur several springs, the principal one of which supplies West's ranch. Its location is Tps. 4 and 5 N., R. 22 and 23 E.
Warren's Springs, Tp. 9 N., R. 3 E.
Warm Springs, near Newbury Station, Tp. 9 N., R. 15 E.
Willow Springs, Tp. 8 N., R. 12 E.
Surprise Springs, Tp. 2 N., R. 7 E.
Seven Palms, Tp. 1 N., R. 9 and 10 E.
Rabbit Springs, Tp. 5 N., R. 13 E.
Crystal Salt Springs, Tp. 5 N., R. 21 and 22 E.
Soda Lake Springs, Tp. 12 N., R. 8 E.
Borax Lake Springs, (Searles), Tp. 19 N., R. 7 W., M. D. M.
Hedden Springs, Tp. 18 N., R. 1 E.
Lone Willow Springs, Tp. 18 N., R. 46 E., M. D. M.
Salt Springs, Tp. 17 N., R. 8 E.
Leach's Point and Springs, Tp. 17 N., R. 3 E.
Granite Springs, Tp. 14 N., R. 42 E., M. D. M.
Kingston Spring, south end of Kingstoo Spring Mountain Tp. 21 N., R. 10 E.
Boiling Springs, on east border Dry Lakes, Tp. 20 N., R. 7 E.
Cronise Lake Springs, Tp. 13 N., R. 7 E.
Furnace Creek Spring, its head forms the supply for Colemao Borax Works and Refinery, Tp. 26 N., R. 4 E.
Hidden Springs, Tp. 18 N., R. 1 E.
Bitter Springs, Tp. 13 N., R. 5 E.,
Marl Springs, Tp. 12 N., R. 13 E.
Crossman Springs, Tp. 17 N., R. 15 E.
Rock Springs, Tp. 11 N., R. 16 E.
Rabbit Springs, Tp. 4 N., R. 1 E.
Ludlow Springs, Tp. 9 N., R. 8 E.
Cove Springs, Tp. 8 N., R. 13 E.
Palm Spring, Tp. 1 S., R. 8 E
Brown's Well, Tp. 5 S., R. 16 E.
Chuchawalla Springs, Tp. 7 S., R. 17 E.
Mule Spring, Tp. 7 S., R. 20 E.

This list of wells and springs, and their localities, though not of interest to the general reader, is of the utmost importance to the desert traveler.

Artesian, Pump and Curb Wells.

At the Amargosa Works in the Death Valley basin, a well has been sunk to a depth of 528 feet, using a seven-inch pipe. The discharge is 20,000 gallons in 22 hours, throwing the water above the curb 20 feet.

Four miles south from this point is a well sunk to a depth of 40 feet. From its bottom, when bored 40 feet farther, a flow of pure water came in so strong that the workmen were unable to put in pipe, and the water having no check or restraint, flows to the surface and overflows. The Calico dry lake, situated four miles north of Daggett, contains six wells on its northerly shore, from one-fourth to two miles apart, which average 100 feet deep and in which the water rises to a hight of ten feet in inexhaustible quantities. The water is pure and soft. The wells on the north shore of Lava Bed mountain, in a dry lake 35 miles east of Daggett, average 60 feet in depth. Water good and supply inexhaustible.

The wells of the Ludlow dry lake, eight miles north of Ludlow station, on the north shore, 80 feet deep, furnish an abundant supply of good water.

On the north shore of the Rabbit Spring dry lake, 18 miles northeast of Victor, a well furnishes an abundant supply of pure water; the same at Warrens and at Dry Lake, 40 miles east of Victor. Two wells over in New York valley, 35 miles north of Providence, at a depth of 14 feet; two at Black Ranch, 20 miles northwest of Barstow; one at Galena district, 30 feet deep, nine miles west of Oro Grande; Naelans well sink on the south shore of Death valley, three miles south of Saratoga springs; one well sunk five feet at Valley Wells, 37 miles southeast of Soda lake, all furnish an abundant supply. The above wells were all sunk on non-alkali soil. I find that the wells sunk on soil covered with alkali show the same result. For instance, at Soda lake, Warm Springs, Dry lake, etc., the water of all of the wells is found near the surface. At a proper depth there is no doubt but what artesian water could be obtained. That the soil possesses great qualities of fertility is demonstrated by the rank growth of several varieties of grasses and wild flowers whenever there is an unusual wet season.

Storage Reservoirs

We have already made reference to and described in part the immense storage systems that become necessary in order to render otherwise arid lands south of the San Bernardino range susceptible of cultivation. Suffice it to say, there are many available reservoir sites in the valley that have not as yet been utilized. The writer noticed one in particular 1½ miles east of Lyth creek in Sections 4 and 9, Tp. 2, N. R., and 4 and 9 N., R. 5 W., where a flat known as Lycem occurs consisting of 160

acres. At its outlnt a dam 600 feet long by 75 fent in hight, with a hasn of 150 feet, costing not to exoned $15,000, would form a reservoir which, when filled from the surplns water of Lyth creek, would contain many millien gallons of watnr. Its mean depth would be 40 fent.

Another catchment hasin in the vicinity could hn filled from thn samn sourcn. The dam would hn of the following proportions: 200 feet long from hill to hill and 100 feet high. This would flood an area of three quarters of a mile in length by 300 feet in width hy 40 feet deep sufficient to irrigate 3000 acres. One miners' inch of watnr is estimated to hn enough to irrigate six acres of land. Many of the ditches in this region arn oement linnd, hottom side and permitting an even flow of the water.

Water in ditches that are not cement-lined loses 50 per cent in eight months, while in cement lined ditchen thn loss is only hy nvaporation—not exceeding ten per cent.

The Santa Ana ditch is of this class. Its length is six miles. The dimensions are 4 hy 6 by 3 fnet deep, slope 55 degrees, cement lined.

Desert Regions.

Northb of the range, reservoir sites are also nhundant. There arn many places in tbis region where large areas can be ntilized by short and inexpensive dams conserving and holding for man's nse extensive hodies of water for irrigation purposes. This, with the resultant vegetation (trees and shrubbery), wonld assist Nature in reducing the temperature of the atmosphere many degrees.

Artesian Wells.

Wn have alrnady shown that artesian water in immense quantities oan he obtained in almost any portion of the desert region. Subterranean channels filled with pnre, living water exist heyond a shadow of doubt at greater or lesser depths hnlnw the earth's crnst, which serves as a blanket, proteoting it from the desiccating effects and powerful rays of the sun. These ohannels form nnderground rivers constantly receiving fresh snpplies from tributary streams and sources, the combined watere of which form the artesian belt of this region. In the immense superficial area of 14,340 square miles of territory that comprises the desert region, the snhterranean waters are not confined to one channel, hut there are many large branchee or forks to the main arterial stream, which in thumselves form rivers of no small proportions. Toe evaporating rays of tbe sun, though powerful, are not sufficient to take up hut a very small perocntage of the water that falls from the heavens even in an ordinary season, much less the unusual preciptation of the past year.

C. H. Fairchild, railroad agent of the Southern Pacific railroad, at Mojave, on the desert, who keeps a rain-gauge, furnishes the following date, which I reproduce in connection for illustration:

Precipitation, July 1, 1889, to Dec. 15, 1889	6 52
" Dec. 15, 1889, to Jan. 30, 1890..... .	5 95
Season.....	12,47

This sea of water was not evaporated by the rays of the sun. The precinitation from Dec. 15 to Jan 30, 1890, was 5.95 feet. Thermometrical readings during that time showed a mean of 46 degrees Fahrenheit. Ice was often formed, the thermometer renging from 30 to 62 degrees. What hecame of this water? It did not stand in pools, and had no surface-flow discharging into any visible stream that debouched into tbe ocean, hnt was absorbed by the sands of the desert passing into snhterranean channels soon after falling, en route to the Father of Waters. Let the reader reflect a moment and use a few figures, and he will find that the down-pour of the aqneous fluid during that period, if conserved on the surface would form an inland lake, covering the whole desert regions, of sufficient depth to float a light-draft steamer.

Underground Rivers.

Tbat waters of nnderground rivers, by the force of powerful hydrostatic pressure, find their outlet in the ocean through snhterranean channels which form hermetically sealed tuher, is a well-attested fact. In the Atlantic ocean, off St. Augustine, Florida, immense springs of pure, fresh water spont up from amid the salt water at conciderable distances from the shore. This phenomenon has been noted in many other places. Water, like other fluids, will find its level. It is these snhterranean streams that form artesian belts. The desert regions of San Bernardino county contain a snhterranean river of thie character of immense proportions. Theee watere have been stored for man's nee and can he brought to the surface hy artesian wells, serving to fertilize and make productive more than four milllon acres of rich land.

I am well aware that this immenee scheme cannot he accomplished by individual enterprise. No individual or combination of individuals have the requisite capital. It requires Congressional action and Government aid.

Senator Wm. M. Stewart and other farseeing statesmen are enlisted in thie cause and moving in the right direction. They are now advocating thie measure in the halle of Congress.

In thie article I have made hnt little reference to the extensive and elaborate system of storage reservoirs, artesian belt with its artesian wells, or other sources of water supply that lie south of the San Bernardino range of mountaine, as I have made special reference to them in a previous article.

(To be Continued.)

Vegetable Fibers.

Shall we ever have the extraction of vegetable fiber by machinery brought to the point of success which will justify a farmer in growing a crop of ramie or other fiber plant? It is interesting to describe how well such plants thrive in this State and what vast sums the civilized world pays the barbaric producer, who works ont the product by hand or with rude appliances, and is content with a few cents a day as wages. It is interesting, too, to read of the many fiber extractors and extracting processes which show fine samples and then offer the farmer a machine or a right to use a process for so many hundred or so many thousand dollars. Such offers do not constitute a practicable basis upon which to urge the production of these fibers in this country. The farmer cannot grow a crop of the fiber plant and then assume the labor and expense of manufacturing it into merchantable fiber before he can realize for his labor and the use of his land. To make the enterprise available the capitalist must buy the machines or the processes and carry on the extracting concern, contracting with the farmer to take his crude fiber green or dry at so much per ton, delivered at the factory or put aboard the cars or steamer. Just as soon as the proposition assumes this phase the farmers of the United States, or some of the States, will produce as much ramie or other fiber-yielding plant as can he profitably sold.

These facts must be recited because articles are now being published calling attention to the New Zealand flax industry and the large purchase of the prepared fiber in the United States. It is needless to send the seed to this country. The plants have been growing in this State for years and have been distributed nearly all over the State by the university. We know from the reports from widely distant experimenters just about in what districts of the State the plant will succeed. The old plants in Berkeley are seeding freely, and thousands of plants can he had by dividing the old clumps. Now, although all these things are so, who can conscientiously advise a farmer to lumber up his land with New Zealand flax, excepting a few plants which will yield him good material for tying vines, plant bundles, etc.? There is a very important step to he put in between the exhortation and the planting of the crop, and that is the work of the manufacturing capitalist who will provide proper machinery and offer the grower no much a pound, bale or ton for his crop as it comes from the field. Will this ever be done?

There is another fiber material which has been paraded for the last score of years as a possible source of great wealth to this State, and that is the wilderness of so called "wild hemp" on a portion of the Colorado desert. The subject comes forward anew in an article in the Yuma *Sentinel*, from which we quote as follows:

"On both sides of the Colorado river, from Yuma nearly to the Gulf of California, the wild hemp grows spontaneously in great abundance. The growth is perfectly wonderful, the stalk reaching a hight of from 20 to 35 feet, but averaging from 12 to 15 feet.

"This great fiber product or plant covers an area of not less than 50,000 acres, and the lowest estimate ever made places the annual yield of the clean or prepared fiber at 500 pounds per acre, or 25,000,000 pounds, equal to 12,000 tons, or 1250 carloads of ten tons each.

"It is estimated that to cut and prepare this for market will cost three cents per pound, or $750,000. A rate of freight to San Francisco of $7 per ton has been offered. The freight at this rate would amount to $87,500 annually. The harvesting of this amount of hemp would give employment to from 300 to 500 Indians for four or five months each year.

"Most of the fiber grows within two to four miles of the Colorado river, although in places it is found back from ten to 20 miles. It is mainly found among the arroyos or natural canals and lower land, which are overflowed or filled with water in the high waters of the Colorado. It can be cut, and the ontside or woody matter can he removed by passing it through a brake similar to that used in the manufacture of flax. This can he done on the ground where the hemp grows, and thus save the hauling and freight of the extraneous matter, leaving only the fiber to he packed in halee and shipped.

"Using Indian labor, the fiber can he prepared, haled and transported to the Colorado at an expense not to exceed three cents per pound. Even supposing that the freight should reach $10 per ton to San Francisco, this would make the cost of production and delivery 3½ cents per pound.

"The lowest price offered for the prepared fiber delivered in San Francisco is five cents per pound, which leaves a profit of $30 per ton, or $375 000 for the crop per year at the lowest estimate of the yield in the poorest years. This offer has been made for the fiber in 10,000 ton lots, by an English company already engaged in the manufacture of rope, cordage-twine, sacks and matting.

"A wealthy German, engaged in the same industry, after having experimented with the hemp, made an offer of eight cents per pound in 10,000 ton lots, delivered at the month of the Colorado river or in San Francisco, which would leave a profit of $90 per ton, or $1,125,000 per annum. According to these figures, in the good years there would he expended for labor more than $5,000,000, for freight $800,000, with a profit of from $3,750,000 up to $10 000,000 per annum."

This is about the usual wild way in which this fiber industry is generally presented to the public. The tidings comes to the weary mechanic and fills his brains with visions of mechanical triumphs in extraction or to the ears of the poor farmer who longs for some crop which will pay him more money than he can secure hy his present rotation. They all discover, after wasting much time and sometimes money as well, that the proposition is not yet upon a working hasis, and that the articles are written either to win investment in some land scheme or some process scheme. We believe there will yet be profit in fiber production in this country, hut it will not be reached until propositions assume more practicable forms than those in which they now usually appear.

Removing a Bar.

Mr. Joseph McGillivray, formerly of this city hut now a resident of Liverpool, writes as follows to the Liverpool *Journal of Commerce* on a method of improving the harbor bar: I find from a map of the Mersey Docks and Harbor Board of last year's soundings of the part known as the Liverpool har, that the water at low spring tide is only ten feet, and at a point and on a line 300 yards north of and parallel with the line hetween the Bar Lightship and the Formby Lightship; that the distance across the har, from 18 feet depth inside to 27 feet depth outside, is 1800 feet, ontside of which there is ample depth of water and plenty of space to deposit sand from off the har. My plan to deepen thie part is hy assisting the current to scour out a channel through the 1800 feet, bringing it down, at least, to the 18 feet inside. The reason why I take the depth from 18 feet to 27 feet is in order to have grade to assist the current to carry ont the sand. My plan would he to get a set of gang-plows attached to a V-shaped frame, drawn by a towhoat, turning over and entirely loosening the sand, which the last of the ebh tides would carry out and which could he assisted by the use of force-pumps stirring and driving the sand. Also the slickings from the docks could he let down on it from the boppers in quantities, which would materially assist in moving the sand along with it; also hy temporary guides, forming lines on which the current would act. On making a plan of tbe bar, I find from the different depths, and to do tbe work by sections, in order to get as much grade as possible to work on, that from the point section 1, at which the water is 10 feet to the 27 feet, a distance of 900 feet, there is a grade of 17 feet, or 1 foot to 53 1 17; tbet section 2 from 12 feet to 27 feet, distance 1200 feet, grade of 15, equ ling 1 foot to 80 feet; sections 3, from 14 to 27 feet, distance 1500 feet, grade of 15 feet fall, equaling 1 to 115 3 5. No. 4, 18 ft. to 27, distance 1800 ft., 9 ft. grade, equaling 1 to 200. The best result would be got on the last runs of the spring ebbs, as with the least depth of water the greater would he the scour, and the action of the tide outside the har from tbe 27 feet, with the great area, would scatter tbe sand out of the way. My knowledge of the action of water on material in sluices, as well as in rivers, has been derived from a varied experience in the gravel mines of California, and I fully believe that hy following the substance of the above principles, with probable additions which might suggest themselves as the work went on, and with the large quantity of water which comes in and ont of this large basin, that by assisting Nature the bar can not only be materially lowered, hut can with little help be kept deep enough to enable the largest ships to enter at all times, except, perhaps, at extreme low tides, keeping Liverpool as it is—the first port of the world. In conclusion, I may just add that the plant for carrying out tbe scheme above suggested would cost hut little, the services of a tow-hoat being the principal.

SILVER AND PRODUCE VALUES.—The course of silver since the recent active favorable legislation is of interest as related to produce values. In August, 1889, silver was quotable at 92¼c per oz. in New York; now the quotation is $1 19⅞ per oz., an advance of 27⅝ per oz. This means that a miner having an output of 100,000 ozs. would only have received for it last year $92,500, against $119,875 this year, which gives the mine-owners $27,625 more money to spend or loan out. The more money there is, the cheaper the rate of interest and the higher are farm products, and providing the amount of money does not exceed legitimate needs, and has a good basis of value in itself, the more prosperous are our producing interests.

BUTTE COUNTY MINES.—According to the Oroville *Register* there is more activity in mining properties in Butte than for many years past. The sale of the Greek mine and of the old Cape claim was consummated and the money paid on Saturday last to the various owners. The rich returns from the Forbestown mines are attracting capital, and a number of new ledges give fine indications for the future. The Patterson gravel mine, near the famous Carr mine, is paying from $8 to $50 a day for four men. The Carr mine is known to be very rich. The Reese mine, owned by Messrs. Reese, Walker & Smith, is being opened by a tunnel. The amount of gold shipped from this town is not less than $25,000 a month, while the shipments hy private parties, mostly Chinese, are very large.

Southern Nevada.

Mr. James Delavan, mine-census agent, writes to the Virginia *Enterprise* as follows:

One of the greatest improvements made to facilitate the settling and opening up of the western portion of this State was the building of the Carson & Colorado railroad from the Mound house to the State line, in Esmeralda county, and thence on southerly through Owens River valley to Keeler, in Inyo county. The country through which this road passes was almost inaccessible until the railroad was built. Much promising and really valuable mining country lay dormant, or was so remote from sources of supplies that no mining could he carried on at a profit, and capital could not he induced to venture into those remote regions. But now all this has been changed by the construction of the railroad, and since its completion, many new mining districts have been formed, and mines have been opened and worked, whose product adds much to the wealth of the country. This is especially the case in Esmeralda county, Nevada, and Inyo county, California.

Among the number are the mines in Garfield district, lying west of Luning, on the railroad, and the Santa Fe mines, to the east of Luning. There are mines in Marietta district, west of Belleville, from which place ores are shipped to San Francisco, where they are sold to the Selby Reduction Company. There are ores of different characters in the districts; some are free-milling, containing mostly gold. The railroad facilities make it possible to work many mines in Columbus district that otherwise could not he worked at a profit; also in Silver Peak, Lida valley, Montezuma, Palmetto, Sylvania and other districts in the southern part of Esmeralda county.

In Inyo county, Cal., mines are located and are being developed, some of which are quite promising, that would never have been heard of if it had not been for the Carson & Colorado railroad.

The mines at Cerro Gordo, some of which have been large producers, were worked a number of years ago, when all supplies were carted in from Los Angeles, 300 miles distant. All of the silver-lead bullion was sent to Los Angeles for shipment to San Francisco at great expense for transportation. None but the richest mines could he worked at a profit with all the attending expense of transportation of supplies and conveying the bullion to market.

Now all that has been changed hy the building of the Carson & Colorado railroad, and work has been resumed in the mines of this district, with a prospect that they will now he worked at a profit, and many that could not be profitably worked before the building of the road will be made to pay good profit. Cerro Gordo will undoubtedly become a lively camp. The mines in Darwin and other districts below the present terminus of the railroad are also receiving renewed attention since facilities are such that they can now he worked at a profit.

The borax, salt and soda marshes are now producing largely, since the expense of transportation does not consume all the profits, as formerly was the case.

Mines in Hawthorne district have been opened, and have been and are now being worked to quite an extent, creating much business for the town of Hawthorne and the railroad.

Dr. Yates' Publications.

Dr. Lorenzo G. Yates, the well-known scientist of Santa Barbara, is not only an officer of their local Natural History Society and a a corresponding member of the S. F. Microscopical Society, and of the Washington Anthropological Society, hut also claims membership in the American Horticultural Society, American Association of Conchologists, and Geological Society of America; nay more, his scientific associations extend over the sea to the New Zealand Institute, and the Linnæan and Philosophical Societies of London.

Dr. Yates has published a variety of works, which may be ordered of him at Santa Barbara, Cal, as follows:

The California Digest of Masonic Law, 8vo., 236 pp., cloth, 1867. $1.50. Postage extra.

Catalogue of the Ferns of N. America, 8 pp., 1886 25 cts.

Notes on Hawaiian Ferns, 15 pp., 30 cts.

The Ferns of Ceylon, 33 pp., 40 cts.

Catalogue of Minerals in L. G. Yates' Collection, 71 pp., 50 cts.

Catalogue of Fossils in L. G. Yates' Collection, 37 pp., 25 cts.

Catalogue of Indian Relics in L. G. Yates' Collection, 4 pp., 10 cts.

Catalogue of Land and Fresh Water Shells, (Foreign), 40 pp.

Catalogue of Land and Fresh Water Shells (American), 47 pp.

Catalogue of Marine Shells (American), 30 pp.

Catalogue of Marine Shells (Foreign), 51 pp.

Charm Stones ("Indian Plummets") with 4 plates of 31 illustrations. Price on application.

All Known Ferns (just ready), a book of reference, giving the name, habitat and synonyms of all known ferns of the world; with references to other works. Synopsis of Genera and divisions; Bibliography of Ferns: Key to Genera, etc. Bound in cloth. Price, $3.50; postage extra; or with blank pages for notes and additions, $4; postage extra.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

GOVER.—*Ledger*, Aug. 23: They have struck the ledge at the 600-foot level, and have driven 25 feet into the ledge, and as yet the footwall is not in sight in the end of the drift. From what can be learoed it is a high-grade proposition. Stopes have been opeoed up, from which the mill has been kept running. Preparations are being made to open the mine to the 1000-foot level, and sink 300 feet. A large dam is being made at the 400-foot level, as the company are about to put in a pump, which is to be in running order by the 1st of September. It is to be ruo by electricity. As this is the first introduction of electricity for power in this county, it is looked forward to with great interest.

MISCELLANEOUS.—The ten-stamp mill of the McKenzie mine is running steadily, and the indicatioos are said to be favorable for a good paying run. Robert Reed has sold one-quarter interest in the Reed & Askey mine, near Irishtown, to Mr. Chapman of San Francisco. All the incumbrances upon the property have been paid off, and work is to be resumed next week. At the Amador gold mine the working force has been somewhat reduced, for what reason we are unable to explain. Superintendent Darling has been in San Francisco during the past week. The Alpi M. Co. bave concluded to quit the business and divide the small surplus on hand pro rata among those who paid the last assessment. The dividend amounts to .55 of a cent per share. The 10-stamp mill on the Gardiner mine, near Irisbtown, is almost completed. A contract has been eotered ioto for a 20-stamp mill, but 10 stamps will be completed and started before the construction of the rest is entered upon. At the Clinton Peak claim the tuonel has reached a distaoce of 160 feet, 90 feet of which has been tunneled since the resumption of work in the early part of last month. They expect to tap the ledge io about 40 feet more. V. P. Yelmini of Oneida has secured the Griesbach claim in Pioneer district, and is preparing to commence operations thereon.

Butte.

GRAVEL RANGE.—Oroville *Register*, Aug. 21: It is one of the anomalies of Califoroia mining life to note the difficulties that men overcome to obtain the gold from the soil. Here, near Oroville, 100 meo are at work turoing a great river from its bed that the channel may be scraped and cleaned and the gold takeo from the crevices of the bedrock. High upon the mountains known as the Gravel Range, 50 men are at work seeking for gold under difficulties that would appall any one but a California miner. The example of Col. A. P. Frary is a striking one. Last winter was a very severe one and enormous quantities of snow were piled up on the mountains. When the colonel undertook this spring to reacb his mine it was buried beneath deep snowbanks. Nothing daunted, the colonel set his men at work felling great trees and building huge fires to melt the snow off so as to leave the ground bare. He succeeded and has pushed ahead his mining labor with great diligence. He has built some four miles of mouotain grade over which an eight-horse team can travel. He has placed upon the ground a steam boiler weighing 8000 pounds aod a 45-horse power engine. This week he was down after a fine Hooker pump. The sbaft sunk to reach the rich gravel deposits contains so much water that a steam pump is required to keep the flow down. He has 20 men employed and they are busy erecting a boarding-house, engine, blacksmith shop and other needed buildings. He brought in 36,000 feet of lumber from loskip and in a short time will have everything in running order. He is confident that the gravel will run $6 to the car and believes that in one week from the bour he starts up he can take out gravel enough to pay the whole expense of fitting up the mine. The mine is situated on Brown's Ravine some miles above the Chaparral House. In this same neighborhood is the celebrated Carr mine, the mine of Patterson & Co., that of the Shasta boys, the Silva boys, Reece, Walker & Co., Emerson & Co., Geo. Le Rossignal and Bracken & Doyle. Col. Frary expects to start up washing gravel by the 16th of Septemher, and is confident that in a short time rich returns will be made from this mine.

Calaveras.

WEST POINT.—Cor. Calaveras *Chronicle*, Aug. 22: The mining interest of this vicinity has never had a more cheerful outlook than at the present. The old Keltz, or Peasley, mine, under the careful and cautious management of its owner, O. B. Peasley, is developing ioto a magnificent piece of mining property. The ore extracted at present is the best ever produced from this or any other mine in this locality. Mr. Peasley proposes to erect a mill this fall. Henry Trappanier has had a crusbing of quartz from his mine, which is located near the Keltz, which yielded at the rate of $110 per ton. The Lone Star, or Hurley, Mining Co. is producing good-paying quartz, and its mill is kept at work. The Riverside, under the careful management of Mr. Pierson, is developing excellent quartz and large quantities of it. This mine will, without a doubt, prove a good property. The Anoa, owned by Mr. Steger, and the Josephine mine, owned by S. Ruffino and John Soancovich, the one being the exteosion of the other, have been bonded to Mr. Pierson, who will commence work shortly. Messrs. Bennet & Light, who have been prospecting their mine on the North Fork of the Mokelumne river for some time, have struck exceedingly rich rock. The Blazing Star, which has been leased to the miners for three months to give them a chance to get their back pay, is producing rich ore from a five-foot vein. It will not be long before the men will be paid in full from the product of the mine. The owners of the Wide West mine, under the management of George L. Brown, the enterprising and stirring mining man of this section, are getting the mine in shape for work. Mr. Billings, who is owner of the Tom Payne mine, is extracting first-class paying ore. Mr. Watkins, an enterprising gentleman from S. F. who has been engaged in mining in this vicinity for some time, has undertaken to open the Tucker mine. He has a bond of the mine. The Lockwood mine owners intend to sink their main shaft a few hundred feet deeper. The Scorpion, which has been idle for some time, is soon to be reopened. The Beardsley Bros. are working their mine at Sandy Gulch. The ore taken out by them is valued at $150 per ton. The Woodhouse, a fine piece of property, has been honded by Mr. Fields to S. F. parties. Work has been commenced. Messrs. Dennisoo and Jewel are working the Montezuma, near the Woodhouse, and are taking out good rock. George Chick is working his mioe near the Licking Fork, and is taking out rich quartz. His last crushing of ore paid him a handsome profit. Jacob Hess, whose mine is east of the Lockwood, is hard at work. The quartz takeo out by him prospects very well.

FURNACES. — Angels *Democrat*, Aug. 23: The recently finished furnaces for the chlorination works are now being put in place for use.

Del Norte.

QUARTZ.—Del Norte *Record*, Aug. 23: It is reported that Pat Casey has struck a ledge of rich quartz on Myrtle creek. In the early days that neighborhood was worked with good results.

El Dorado.

RICH GRAVEL.—*Mt. Democrat*, Aug. 23: Recently in prospectiog the Linden mine a fine body of rich gravel was struck. An upraise was in progress when unexpectedly a fine bench of gravel was struck about 10 feet above the former tunnel level. The gravel is reported as richer thao any before found in the mine. The mill was at once set to work on it with good results, and this week an increased force was put to work, the mill now pounding away night and day. Work is being pushed upon the gravel claims at Smith's Flat koown as the Toll House mine. The old shaft has been cleaned out and a prospect tunnel started showiog 18 inches of gravel. The company now having the matter in hand will run a series of drifts aod prospect shafts to determine the lowest point of bedrock, and when that is found a new incline will be made and boisting works and mill put thereon. Work is beiog shoved ahead as fast as possible, that the necessary development work can be accomplished and the buildiogs erected before the winter's raios set in. A 10-stamp mill is already on the ground ready to be put up, and the material for the necessary buildings will be on hand ready for their erection as soon as it is determined where they are to be put. The company means business, and is going at the work in a busioess-like manner.

PACIFIC.—On Saturday last Prof. Thos. Price and nephew came up from San Francisco on business pertaining to the Pacific mine, and as a result of this visit the news is promulgated that the Pacific mioe will at once start up. Orders were given to commence work and this has already been done. The shaft is to be sunk to 1200 feet before a stop is made, and how much deeper the sinking is to go is yet to be determined. But this much is assured, the Pacific mine is to be developed at once. Besides the sinking of the shaft, crosscuts and prospect tunnels will be run and the mine opened in such a way as to determioe just what there is beneath the ground. This move on the part of the owners of the Pacific is hailed with satisfaction by everybody, for it is the universal belief that there is a body of rich mineral in the Pacific, and it only needs judicious development to show it up. The surface plant of the mine is now first-class in every respect, and in thorough order for immediate work. As soon as a new wire rope for the hoisting works arrives, the work of sinking will begio. Placerville and El Dorado county are to be congratulated on the move by the Pacific. It is a mode of going to work that all have confidence in, and good results are confideotly expected.

Nevada.

SPENCEVILLE'S OUTLOOK.—Wheatland *Graphic*, Aug. 22: E. Koertner, in speaking of the mine there, says that Wohler and Pietzsch have just put in oew machinery for grinding the paint, and will use steam hereafter instead of water. They will start the machinery io operation by Monday, when they expect to turn out paint in any quaotity ready for mixing. He says that the iron mine just above Spenceville will be developed before a great while, as a stock company is being organized, with a capital of about $3,000,000. This company, if the plans are perfected, will probably build a railroad from that point to Nicolaus, to connect with the river boats, which will give that portion of the country excellent shipping facilities. Mr. Koertner says this is no mere speculation, but is bound to be a reality.

THE COE.—Grass Valley *Union*, Aug. 22: Yesterday the Coe mine commenced work with Captain Hammill in charge. The pumps were started at noon and it is the opinion of Mr. Hammill that it will take about two weeks to lower the water to the 300 level. The pump is doing its work well and no trouble with it is aoticipated.

Plumas.

A BIG DITCH PURCHASE.—Sierra *Tribune*, Aug. 23: James O'Brien of Smartsville and A. P. White of S. F. have about concluded the purchase of the Plumas Ditch and M. Co.'s property. The ditch is over 30 miles in length, and the claim, for drifting purposes, very rich. The estimated value of the old iron in the claim is sometbing over $10,000. When in repair the ditch-water for irrigating purposes alone would yield a handsome revenue. At the close of the purchase it is contemplated to repair the ditch immediately, so as to afford abundance of water to the many miners having valuable claims in the vicinity.

GENESEE VALLEY. — Greenville *Bulletin*, Aug. 2: The Genesee Valley mines are now enjoying a prosperous era. The most important of these properties is the Genesee gold mine, owned by Joseph Gruss. During the past few years Mr. Gruss has been operating the mine in a small way. However, last season he sunk a shaft to prospect and develop it, which hitherto had been worked on and near the surface only. In the past the broken-up condition of the formation in the Genesee mine led many to believe that the country of which this mine is a part was a slide from the porpbyritic range on the east. Later developments and observations show conclusively that such is not the case. The Genesee has been worked in a small way since 1858, but it now looks as if the mine were hardly prospected. In the course of time Mr. Gruss will put up heavier hoisting machinery and a better mill, and then we expect to see that property become one of the best in Plumas county. The returns are now very satisfactory. East of the Genesee and in the same formation is the Union, owned by T. E. Thurner. The vein was crossed by a tunnel run in the '50's to reach a copper ledge containiog gold. Four years ago Mr. Thurner located the property as an extension to the Genesee. The ore prospects well. It is of the same decomposed, soft nature as that found io the Genesee. Beyond the Union is the Centennial, now operated by Geo. Brandt. The ore is crushed in one of the best 10-stamp mills we have seen in the county. It is located very conveniently in reference to the mine, so that the ore can be delivered at small cost. The tailings from the mill dump into a well-equipped arastra, from which a large sbare of the gold is obtained. The Pilot, owned by J. C. Borden, situated on Cooper hill, above the Genesee mine, is said to be a good prospect, the ore being rich but the vein small. The Tutt mine is similar in character to the Green Ledge. It has small quantities of ore. The Light mines, southwest of Taylorville, are four claims owned by A. C. Light. The two farthest up the mountain, Mr. Light says, contain very large veins of quartz which will pay $5 per ton. The pocket ledge owned by him has been a noted mine. Over $30,000 has been taken out.

Placer.

THE HATHAWAY.—*Republican*, Aug. 20: The Hathaway mine in the Ophir district is one of the quartz propositions there that is proving to be a permanent, steady success. It is owned by the Valentine Bros. of S. F. The Hathaway mill with its 20 stamps is pounding away day and night without interruption, and crusbes 40 tons of quartz a day. The ore is even in value and pays $8 to $8.50 gross rigbt along, of which about $6 is in free gold and the rest is in sulphurets. Four Woodbury concentrators save about all the latter, as is shown by the fact that Gates' blanket system was tried below them, but it has been discontioued because there was not enough left to make it pay. George Taylor is superintendent.

HOGSBACK.—*Placer Herald*, Aug. 23: J. T. McCall, foreman at the Hogsback mine, was in town Monday. Mr. McCall says the new tunnel is now 2200 feet in length, leaving only 350 feet to be run to fioish it. They expect to break through ioto gravel about the first of October.

LINN.—About the first of this month fine ore was struck in the Linn mine, near Damascus, and the owners are so well satisfied that they will push the work of development uninterruptedly uotil the ledge is opened. The prospects warrant them in believing they have a permanent paying mine.

DOIG.—A. Shurtleff is running a drift from the shaft io the Doig mine. He bas run 90 feet and expects to strike in the next ten feet. If he doesn't he will run another drift in an easterly direction and connect the drifts with a crosscut. He has rock that pays $25, but is confideot that he will strike richer ore. He is right after it, and will find it if aoy one can.

San Diego.

AT JULIAN.—*San Diegan*, Aug. 18: Julian has not been so lively for years. Two months ago even there were more rooms for rent in private houses than people to occupy them, and the hotels were running at a positive loss. Now there is not an empty room in the town or vicinity. New buildings are being erected and business activity is seen in all branches of trade. The new road to Banner, four miles from Julian, is about finished. This will tap at least 50 mining properties. Teams were oever in greater demand in the district than at present, and many six-horse outfits have been taken to Julian and Banner from this city. Governor and Waldo Waterman have purchased the Gardner group of mines, and six men were put to work last week oo a contract to open up 1000 feet of tunnel. At first this is all the men that can be utilized, but as the ledges are struck more miners will be required. From a low estimate 75 men will be at work on this contract alone, as the Governor intends working every new ledge that is eocountered, and to the fullest extent. Sixty days ago there were not more than 30 miners at work io the immediate vicinity of Julian; to-day there are not less than 200 engaged. Capitalists from San Francisco have stepped in quietly and purchased the Warlock, Vulcan, Chaparral and two other mines, and are awaiting bids to let the contract for working them. Good miners can find plenty of work and sure pay on the Kentuck S., Helvetia, Ready Relief, Owens, High Peak, Stonewall, Hidden Treasure and Gold King and Queen. There is no boom in Julian, but a healthy activity is there both in mining and agriculture.

Shasta.

DOG CREEK MINES.—Cor. Redding *Democrat*, Aug. 23: We paid a visit to the McCall mine on Saturday last. There is a tunnel in 50 feet tapping the ledge at a depth of 100 feet. The ledge is four feet wide and assays from $60 to $70 per ton. The Altunis is an extension of the McCall. This ledge has a tunnel 150 feet in length tapping the main ledge at a depth of 150 feet. The ledge is three and one-half to four feet in width, and assays about the same as the McCall mine. These two mines are considered the best in the Dog Creek district. The owners of these mines, Messrs. Asa Elison, James Bard and James Hunter, are all old miners of 40 years. The Trinity mine was sold to a company from below. These people are trying to bond or buy all that is in sight.

Sierra.

EXTENSION TUNNEL. — *Mountain Messenger*, Aug. 21: The Extension tunnel is now in 4456 feet. The rock in the face is in streaks, hard and soft, as is natural in a tunnel running at right angles to the strike of the country rock—the tunnel now beading due west. There is a probability now that the tunnel bas reached the east rim of the cbannel.

ACCIDENT.—There was a premature blast in No. 4 tunnel of the Young America quartz mioe last Wednesday, and Mr. Cundy and Mr. Freitas were badly injured, and Mr. Milesi and Crossman escaped with slight bruises. Mr. Freitas' back and left leg were seriously cut, but not dangerously. Cundy died Thursday night from the effects of his injuries. The accident is reported to have occurred in this way: The night shift put off a row of boles when they quit work, and one of them did not explode. When the next sbift went to work the charge exploded. Mr. Freitas is said to be more seriously hurt than was at first supposed.

DIVINING-ROD MINING.—Sierra *Tribune*, Aug. 23: John Young, an industrious German, has run somethiog like 500 feet of tunnel in lava formation up in the vicinity of 1001 gravel mine in search of a rich quartz ledge which he has beeu told exists there by some person who locates gold something after the divining-rod style.

Siskiyou.

PLACERS.—Yreka *Journal*, Aug. 23: Mr. Deming, who recently purchased the Pinery diggings in Scott Valley, is now making arrangements to open and work them on an extensive scale by first removiog the buildings. Campbell had a good clean-up at his extensive placer mine in Quartz Valley, a few days since, realizing bigger pay than for several years past, by reason of having a greater abundance of water to work successfully. The cleanup at the Jillson & Co. blue gravel mine on Cottonwood, in this county, a few days ago, is reported to have amounted to $15,040, which is a big haul for a new mine just opened.

SALMON RIVER.—Cor. Siskiyou *Telegram*, Aug. 23: The Shumway Bros. have their head dam completed and are now at work on their ditch and flume. The Heiney claim, owned by Frank Heiney and father, commenced hoisting gravel about the middle of this week. Mr. McLauchlin closed his mine down after a long and very successful run. He picked up a piece the other day which was worth $25 and aoother that weighed $35, and several others from $10 up to an ounce. The Knownothing quartz mine is under the management of Lewis Blevins, who deserves great credit for his work. The mine looks first-rate and they are taking out coosiderable ore.

HENLEY.—Blue gravel seems to take the lead here above all other things. Jacob & Coyle's mill, which has been ruoning on gravel taken from the Black Jack mine, made a partial cleanup and $138 was taken from 47 tons of gravel. This is considered a very flattering prospect — the best ever found in Northern California. This prospect has put some of our mining men on edge, and they are busily looking around for locations. Everybody wants to be a millionaire. There are hundreds of acres of this gravel in this locality—no one can guess the exteot of it. It is capped over by sand rock. This will be a mining camp where sandstone will lie between the miner and the farmer, and both can work, one on top, the other in the bottom. The time is near at hand when the mines will go through this said stone and down to the very bowels of the earth and bring up the filthy lucre. This will prove to be one of the best mining camps on the coast. You will hear of big returns from here in the near future. Mr. Letner, who is employed at the Jillson mine, Henley, tells us that they will commence Monday to improve the mine by constructing three under-currents to catch fine gold, building 150 feet more of flume and start the drifting of a 100-foot tunnel in which they intend to fire 2500 pounds of powder to loosen things up a little. Eight men are to be employed. Mr. J. F. Calderwood of Sacramento bought 10,000 shares of Black Jack mining stock from George Bar. This is evidence that people of the lower country are pleased with our mines.

Trinity.

CANYON CREEK MINES.—*Journal*, Aug. 23: A visit last week to the mines on Canyon Creek satisfied us that this camp is destined to become one of the foremost in the county. All the ledges being worked show permanency and depth and are of good grade and size. C. C. Shattuck has made arrangements with W. J. Grigsby to put up his Huntington mill on the Buck's Ranch mine. They are now grading and getting out timbers for the purpose and it will probably be not very long before transportation of the mill will begin. They have a large ledge and where they have struck it with a tunnel it prospects well. The facilities for working this mine cannot be excelled in any country. Plenty of wood and water to run the year round. Very low-grade ore could be handled with profit. The tuonel on the Bailey is supposed to be within 10 or 20 feet of the ledge for which they are running, but as the rock is very hard through which they are running, slow progress is made, about one foot a day with two shifts being the limit. The tapping of this ledge this depth (300 feet) will make the property of great value, but even if they should not tap it, the mine is a bonanza, for the first ledge tapped is enough for a big mine. When machinery will be put on we cannot say, but it would not surprise us to see it put on at any time. The company operating on the Chloride is highly encouraged by seeing the ledge holding out as they follow it into the mountain. The ledge averages between three and four feet and the ore is of good grade. They are at work oo three tunnels and developing the property as fast as possible so that the machinery can be put on before the rainy weather sets in if the prospects justify such a move. The location of Weyand, Tighe, Everhart, and Meckle at the head of Owens creek is looking well.

LOOKING WELL.—The mine of Blakemore and Springstead near the Blakemore ranch is looking well. They are down 30 feet with the shaft and have a four-foot ledge. The ore is low-grade, but there is too much gold in it to quit work oo it.

Yuba.

MINING AND MILLING PLANT.—Grass Valley *Tidings*, Aug. 22: A meeting of the owners of the Good Hope mine at Cahbage Patch, just over the line in Yuba county, was held in this city Thursday night. It was reported that Messrs. Gamble & Guerne of Santa Rosa had remitted a check for all expenses incurred under their bond and would not resume operations. As they have not been here for several months to look at the mine, their action is inexplicable, but nevertheless satisfactory, the owners having determined to develop the property themselves. Several offers to bond have been rejected, and about the middle of next mooth the work of erecting on the property a hoisting and pumping plant and a five-stamp mill will be commenced. The shaft is down 100 feet and the ledge opened up on either side by drifts. There is ore worth $1000 on the dump.

NEVADA.

Washoe District.

ORE AND BULLION YIELD.—Virginia *Chronicle*, Aug. 23: This week's ore yield of Comstock mines aggregated 5527 tons, divided as follows: Con. Cal. & Va., 1630 tons, assay value, $23.25 per ton; Savage, 455 tons, assay value, $19.40 per ton; Yellow Jacket, 600 tons, assay value, $21; Crown Point, 784 tons, assay value, $14.71; Justice, 210 tons, assay value, $23.76; Alta, 340 toos, assay value, $21.50; Overman, 452 toos, assay value, $21; Chollar, 130 tons, assay value, $21.43; Belcher

276 ton, assay value, $21.53; Hale & Norcross, 450 tons, assay value, $20. Following was the bullion yield of the ore product from each of the above mines, estimated on the probability that 80 per cent of the value of battery sample ore pulp assays were returned: Con. Cal. & Va., $34,108; Savage, $7050; Chollar, $2228; Yellow Jacket, $10,100; Crown Point, $9250; Overman, $7600; Alta, $5850; Justice, $3850; Belcher, $3800; Hale & Norcross, $7200 Total, $92,036.

SIERRA NEVADA.—On the 630 level from the west crosscut from the southwest drift from the shaft station, 280 feet in from the mouth of the crosscut, north drift No. 2 is advanced 185 feet, continuing in porphyry and quartz of no value.

UNION CON.—On the 1465 level from the north lateral drift, opposite west crosscut No. 4, east crosscut No. 1 is advanced 722 feet, continuing in porphyry carrying clay separations.

MEXICAN.—On the 1465 level east crosscut No. 1, opposite west crosscut No. 5, is advanced 122 feet, the face in porphyry.

OPHIR.—On the 1300 level the winze is down 123 feet below the sill floor of the southwest drift on this level, and the bottom is now in porphyry. The winze will be carried down vertically to connect with the 1465 level workings, which will give good ventilation.

CON. CALIFORNIA & VIRGINIA.—The 1300 and 1500 levels continue to yield the usual quantity of ore. There has been extracted during the week from all parts of the mine 1705 tons and 1410 pounds of ore, which was shipped to the Eureka mill, battery sample assays showing an average value of $23.25 per ton [1630 tons milled]. Bullion valued at $49,798.20 shipped to the Carson Mint.

SCORPION.—The southwest drift from the 660 level continues in clay and porphyry.

ANDES.—On the 420 level a north drift from No. 1 west crosscut is out 28 feet; face in low-grade quartz.

SAVAGE.—Shipped 455 tons of ore, showing an average value of $19.40 by battery sample assays. Bullion on hand valued at $14,629.81.

HALE & NORCROSS.—Resumed ore shipments to the Nevada mill Aug. 20.

CHOLLAR.—Extracted 130 tons of ore, battery sample assays showing a value of $21.43 per ton. The falling off below the usual average is due to hanging up of stamps pending repairs to the Nevada mill.

POTOSI.—The incline winze is down 352 feet below the 930 level; bottom in porphyry and harren quartz.

ALPHA.—The 600 level southwest crosscut is in 172 feet, the face in clay and porphyry.

CON. NEW YORK.—The 650 level north drift is out 57 feet and continues in porphyry.

SILVER HILL.—The 334 level northwest drift is out 350 feet; face in clay and porphyry.

IMPERIAL.—The 1000 level west crosscut No. 1 is in 293 feet, the face in quartz and porphyry. Joint Challenge-Confidence west crosscut No. 2 is in 360 feet; face in barren quartz.

YELLOW JACKET.—Shipped 600 tons of ore showing average assay value of $21 by battery sample assays. The 500 level east crosscut No. 2, 100 feet south of No. 3, is in quartz.

CROWN POINT.—Shipped during the week 784 tons of ore, showing an average value of $14.71 per ton by pulp assays. The 300 level east stope is still showing fair grade ore which is growing narrower.

CONFIDENCE AND CHALLENGE.—The 750 level joint west crosscut No. 1 is in 40 feet; face in porphyry.

BELCHER.—Shipped during the week 276 tons of ore showing a value of $21.53 per ton by battery sample assays. Are opening second floor of 1000 level stope. A north drift from the 1300 level south drift is out eight feet, following a low-grade quartz stringer.

SEG. BELCHER.—The 850 south lateral drift is out 140 feet; face in soft porphyry. A west crosscut from the end of this drift is in 18 feet; face in soft porphyry.

JUSTICE.—During the week crushed 210 tons of ore showing a value of $23.76 per ton by battery sample assays.

ALTA.—The ore output this week was 340 tons, showing an average assay value of $21.50 per ton by pulp assays.

OVERMAN.—Shipped 396 tons of ore during the week showing an average value of $16.11 per ton by battery sample assays, of which $9 24 was gold.

OCCIDENTAL CON.—Continue to extract ore of fair quality from the stopes on the 400 and 450 levels.

Central District.

BONDED.—*Silver State*, Aug. 23: L. F. Dunn bonded the Millionaire mine in Central district, from A. H. Ruse and his son, S. W. Ruse. Some California men are about to buy the mine, and one of them, Charles Mather, is now having samples of ore taken from all parts of the mine, and will test it by working process. If the test is satisfactory, the mine will be sold.

Ely District.

INSPECTING THE BONANZA.—White Pine *News*, Aug. 21: Mrs. Josephine Walcott, in company with A. Derre (expert) and A. Waitenweil and M. Bratnober (capitalists), arrived here Monday morning from the West and spent two days examining the Joanna Bonanza. From one of the party a *News* reporter learned that the gentlemen were well pleased with what they saw in the mine and believed the property to be a valuable one. The water question—how to secure water facilities for milling purposes—seemed to be the great obstacle in the way of making the Joanna a profitable investment for capitalists. When we assured the party that that was a bugbear that need not frighten away intending purchasers, as Murray creek furnished an ample supply of water to run a thousand stamps, and it could be either purchased or leased on reasonable terms, the reply came, "the title to Murray creek is clouded with threatened litigation." This plea we consider rather flimsy, and if these parties want a good mine, and they have found what they want in the Joanna, the outside issue of water for milling purposes can be easily arranged, with not a shadow of cloud of future litigation.

ARIZONA.

GOLD.—Mohave *Miner*, Aug. 23: The gold properties in the vicinity of Cerbat Wasb are now lively. The Flores Co. is working its property with a day and night shift. Little & Maher are working a gold claim just north of Flores. Twiggs & Kelly are at work on the Robert Emmett. W. B. Campbell is working a claim across the wash from the Flores. A. James is at work on claims near the adohe cabin and has a force of men building offices and other buildings. Next week a force of men will be at work on the Esmeralda.

ASH CREEK.—Prescott *Journal Miner*, Aug. 20: Mining has received quite an impetus recently on Ash creek. A number of prospectors are at work there and are meeting with good results. Frank Kuhne, James King and John McDermid have about five tons of high-grade ore at the sampling works taken from the Sunset mine on Lynx creek. W. H. Storms, who recently took a bond on the Ohio mine in the Hassayampa district, has six men employed developing the property. He started a new crosscut on Saturday. The ore body in the mine is now about eight feet wide, and the mine is looking well. He has about 200 tons of fine gold ore on the dump.

AMULET.—F. E. Doggett, who was the discoverer of the Amulet mine on Lynx creek, and made a competence from working and selling it, after about two years spent in traveling, has again yielded to the fascination of hunting for the precious metal, and on Saturday he and his former partner in the Amulet, J. M. W. Moore, purchased a half interest in the Zero mine for $1500. This claim was owned formerly by Wm. Jennings, who, in order to get a little ready money, sold out for $200 or $300 to E. S. Clark and A. C. Gilmore, who in turn sold a small interest to C. W. Coover and others. The new owners, instead of waiting to see the ore bulge out through the top of the ground, went to work developing it, and with every stroke of the pick and every blast of giant powder the property improved in the quantity and quality of the ore.

BRITISH COLUMBIA.

THE TOUGHNUT.—Nelson *Miner*, Aug. 20: The Toughnut is looked upon as the king-pin of the claims on the western end of the Toad Mountain mineral zone. Work on the shaft was resumed about two weeks ago, and already encouraging reports are heard. The ore taken out of the shaft last summer, and also that taken from the tunnel, carries a good deal of zinc, along with galena and copper. The ore now found at the bottom of the shaft is changing to a high-grade cube galena, which, from several blowpipe assays made this week, is said to run pretty high in silver. This property is owned by men who have ample means to develop it.

GOOD ROCK FROM THE GRIZZLY.—Assessment work is being done on the Grizzly by the Frys, the original locators, they paying no attention to the parties who relocated it this spring. The Grizzly is the eastern extension of the American Flag, one of the Hall claims. The ledge is easily traceable and the ore resembles that from the great Silver King. An assay made this week from a fair average sample of the ore on the dump gave a return of $79.20 in silver.

IDAHO.

HYDRAULICKING.—Spokane Falls *Review*, Aug. 21: Capt. Sanborn of the steamer Cœur d'Alene was in the city yesterday and gave the information that operations have commenced on the placer mines located in the Cœur d'Alenes. The hydraulic piping process used was finished Tuesday and operates very successfully. Already considerable development work bas been done and a quantity of free gold extracted, showing conclusively that the district is rich with the precious metal.

NORTH STAR.—Ketchum *Keystone*, Aug. 24: The North Star has struck it rich. The operators have been following the ledge for several weeks and are down about 200 feet, where they have come upon a fine body of high-grade concentrating ore. The ledge is now about three feet wide and increasing in width as work progresses. An increased force bas been put to work on the mine. Harry Kirk, who bas been to St. Louis in the interest of the Cinnabar mine, returned last Tbursday. The machinery for a ten-stamp mill will be here in about 15 days. Titus & Griffin brought down a few tons of ore this week from the Keep Cool mine, Galena, which averaged them about $150 per ton.

RICH ORE IN GERMANIA BASIN.—Wood River *Times*, Aug. 20: Kenneth McLeod, who has just returned from a trip to Germania basin, feels quite enthusiastic over the mine properties which he saw on the way in and out. All that region will be good as soon as capital is obtained to open the mines, but in Germania basin there are 300 tons of gray copper ore, worth about $400 per ton, awaiting shipment, on the dumps of the Bibleback, Idahoan and two other claims owned by Dave Woods of Bonanza. This ore will he shipped in September.

LOWER CALIFORNIA.

ALAMO.—*Lower Californian*, Aug. 21: The Santa Clara M. Co. is working daily on the Aurora mine aod the ore is being taken out fast enough to keep the mill running night and day. The pump is at work and it enables them to work at the lower level. Work is temporarily suspended on the Encantada. Luis Lopez has a fine lot of ore from the Placer which he began crushing last Monday. It promises to run high. The Gen. Torres mine is quite a fine property. It deserves a mill instead of a single arastra. The Asbestos, the richness of which was a matter of doubt, has come in again and will prove to be O. K. after all. The Scorpion is being worked under a lease. The Tarantula is in base ore and absolutely nothing can be done with it until concentrators are introduced into some of the mills. Two placer miners took 99 pwts. and 7 grains of gold from a plat of ground 4 by 16 feet, and they have several more such plats yet to work. Placering in general is taking a boom and is getting popular. George Blethen's stamp-mill in Mexican Gulch will start up next Monday on ore from the Centipede mine. The Princesa Co. now has three big mines yielding gold, night and day. They are the Princesa, Ulises and Indio. The scene at one of these mines in the night, with their big boilers, hoists and busy men, who work in the light of many candles and lamps, shows the faith of men who dig for gold. The foundation for the concentrators to be added to the present Princesa Co. mill is complete, and the machinery that is here will be put into place. The Manzanita mill is running day and night on the Princesa Co.'s ore. Lane's mill, also, is running on their ore. The El Paso mill is not running at present, but is preparing to start up in a very short time. The El Paso Co. is building a good hoisting works on the El Paso mine, adjoining the Ulises, under the direction of Supt. McLaran.

MONTANA.

GOLD.—*Inter-Mountain*, Aug. 22: J. R. Boyce this morning was showing his friends a handsome lump of gold retort just cleaned up at the Red Lion mill, on Upper Flint creek. The cleanup is not large, but the gold is very fine. Mr. Boyce thinks the lack of success in saving a better percentage of the gold is due chiefly to their imperfect mill equipment. Their ore, he says, contains good pay and they have only to make a reasonably fair saving in order to pay good profits.

THE SOUTHERN CROSS.—The Cameron mill is pounding away steadily on Southern Cross ore, and from all indications considerably better saving of gold is being made than during the three or four months run last winter. It seems to be pretty definitely determined, however, that a high saving of Southern Cross gold cannot be made on copper plates, in the usual method of arrangements. The electro-plated coppers, however, which were added just before the mill was started up, are doing much better work than the raw copper formerly used, and it is thought probable that from 60 to 65 per cent can be saved by the use of plenty of electro-plate surface. Ultimately pans will be put in.

THE LUXEMBOURG.—Salton Cameron's new strike in the Luxembourg still lasts. He is now down about 60 feet and has had from two to four feet of ore almost from the surface—ore which all prospects well in a gold pan, and some of it is believed to be worth about $100 to the ton. Mr. Cameron's proverbial good luck seems to still stay with him.

THE M'DERMOTT.—W. F. Shanley reports that the McDermott gold mine near the head of Bear gulch is keeping up its good reputation. It is now opened to a depth of nearly 100 feet and considerable drifting has been done, showing a continuous ore body thus far about three feet wide and running between $30 and $40 per ton.

THE OBELISK.—To-day night and day shifts were put to work on the Obelisk mine near Basin City, and the tunnel which is now being run to tap the lead will he driven as fast as men can drive it.

SHIPMENT.—Boulder *Age*, Aug. 20: A recent shipment of 17½ tons of ore from the Golddust mine, Park district, to the Omaha smelter, gave a gross return of $1246, and netted the owners $886. The vein is two feet wide and very promising. A steam hoist will go up this week.

THE LEXINGTON.—*Inter-Mountain*, Aug. 22: The most energetic mining corporation in the district continues to drive its drifts and crosscuts on the 1500, and of the former it may be said with very favorable results. The mine under such able management as that of Superintendent Rueger and Foreman Kellogg will in the future be remembered as the one which determined by active and energetic experience, that deep mining was no mytb in this the richest and largest mining camp on the face of the earth to-day.

THE MOUNTAIN VIEW.—The management continues to drift on the ledges, more attention being paid to the seven, eight, nine and 1000-foot levels. All the levels below the seven are in strong leads with no breaks, being compact and mostly of a first-class character of ore.

THE ALICE is dropping its stamps on ores entirely from its own mines, and is making regular shipments of bullion. This company will, on the 1st of September, pay its 25th dividend of 6½ cents per sbare, making a total disbursement in the city of New York to the stockholders of $25,000. The mines of this company are being worked to the full capacity of their mills. This mine is second in depth only to the Lexington, and the very recent find in the Lexington on the lower levels has tended to enhance the value of this property, as the Blue Wing, whose lead is conceded to he the one encountered in the Lexington, runs for a distance of 1400 feet through the Alice ground.

UTAH.

ORE AND BULLION.—*Tidings*, Aug. 22: The week has been a good one in the production of ore, and fair for bullion. No marked event has been developed, but the advance in silver and the firmness of lead have combined to make better feeling than for a long time past. Dividend-payers can pay more than hitherto, and mines that in the past have not paid, can now be worked at a profit. The receipts of the metals in this city for the week have been to the aggregate value of $240,906, of which $149,309 was in ore and $92,507 was in bullion. The previous week the receipts were valued at $155,982 in gross, of which $87,281 was in ore and $68,161 was in bullion. The product of the Ontario for the week was of bullion, 26,625.18 fine ounces; ore sales, $23,471.18; an approximate total of $50,096.36. The Horn Silver reports no change in its average production of about 1000 to 1200 tons per month. Its ore continues to be sold in Colorado. Bullion receipts in this city for the week were valued at $35,919; base bullion, $7918; gold bar, $4000; silver ores, $9800; selected lead, $3360. The Hanauer smelter produced during the week bullion valued at $21,600. Ore receipts in this city for the week were valued at $77,808 by Wells, Fargo & Co.; $62,100 by McCornick & Co.; and $19,401 by T. R. Jones & Co.

IN TINTIC.—Salt Lake *Stock Exchange Journal*, Aug. 20: The reported great strike in the Mormon Chief, situated in the Tintic district, is now no longer a matter of conjecture. The property was experted on Wednesday of this week by J. C. Mathers, who is standard authority on mines in this locality, and by him pronounced to be as fine a piece of undeveloped property as there is to be found in the Territory. Three hand samples were tested by McVicker yesterday, with the following results: 1—137.39 ounces silver; 2—40.95 ounces silver; 3—143.75 ounces silver; all carrying a heavy trace of gold. The vein is strong and well defined, the mineral being a chloride formation, with sulpburets of silver. Pay ore is now being mined and a shipment will be made at an early date,

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUGUST 19, 1890.

434,552.—BEDSTEAD—F. H. B. Babbe, Santa Rosa, Cal.

434,695.—GAS ENGINE ATTACHMENT — Barrett & Daly, S. F.

434 555.—HANGING-UP ATTACHMENT FOR STAMP BATTERIES—I. K. Cleaver, Deadwood, Cal.

434 556.—FIRE-PROOF PAINT—J. T. Durkee, Port and, Or.

434434.—ANIMAL TRAP—R. E. & A. J. Eads, Pomona, Cal.

434 772.—TOOL-HANDLE—J. W. Eaton, Placerville, Cal.

434,780.—TOOL-BOX—C. O. Hescox, Tacoma, Wash.

434 712.—LIFTING JACK—Milo P. Holmes, S. F.

434,785.—GUN SIGHT—O. A. Horner, Eureka, Cal.

434,718.—LEAF-TURNER—W. F. Mitchell, S. F.

434,453.—ELEVATOR SAFETY DEVICE—E. F. Moenning, S. F.

434,565.—DRAPER SLAT PROTECTOR—Wm. D. Nelson, Traver, Cal.

434,677.—RIVETING MACHINE — Geo. Pardy, S. F.

434,463.—STEAM CONDENSER—F. Rademacher, Los Angeles, Cal.

431,814.—SUBSOIL IRRIGATOR—J. H. L. Tuck, S. F.

434,617.—STOVE-LID LIFTER — P. Wilhelm, Portland, Or.

434,494.—HARVESTER—T. C. Wilkin, Independence, Or.

434,693.—ORE CONCENTRATOR BELT—G. E. Woodbury, S. F.

The following brief list by telegraph for Aug. 26 will appear more complete on receipt of mail advices:

California—Alfred Brumwell and M. E. Doolittle, Kansas City, Mo., assignors of one-third to J. M. Thompson, S. F., cable-grip; Ellswood Chaffey, Santa Monica, mechanism for transmitting power; Frank M. Merrill, Oakland, compressed air street-car motor; Henry E. Skinner, assignor to A. T. Allen, S. F., trolling spoon. Washington—August F Baatz, Bellingham, railway brake; Frederick Ban, Tacoma, soldering iron.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SLAT-PROTECTOR FOR DRAPERS.—Wm. M. Nelson, Traver, Tulare Co. No. 434,565. Dated Aug. 19, 1890. This invention relates to the general class of drapers or belts for agricultural implements of any nature, and it consists in the novel construction and combination of parts, the object of which is to accomplish the double purpose of protecting the ends of the draper-slats or sticks by preventing them from splitting, and of guarding the rivets which hold the sticks to the belts and preventing them from wearing loose and dropping out.

PORTABLE BEDSTEAD.—F. H. B. Babbe, Santa Rosa, Sonoma Co. No. 434,552. Dated Aug. 19, 1890. This is one of that class of bedsteads which are so constructed that their several parts may be readily taken apart, disjointed and folded upon one another, whereby the structure is reduced to small compass and may be easily disposed of or transported. The object of the invention is to provide a simple, strong and readily-manipulated bed of this class.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

CALIFORNIA SASH-BALANCE CO., S. F., Aug. 17. Object, to manufacture sash-balances. Capital stock, $250,000. Directors—A. W Forbes, Joseph D. Redding, Benjamin Marshall, Frederick R. Webster, Jerome A. Hart, Charles F. Crocker, R. P. Hurlbert.

TULARE ELECTRIC LIGHT & POWER CO., Aug. 17. Capital stock, $50,000. Directors—F. W. Eaton, John C. Turner, George A. Davis, H. C. Miller, C. D. Cushing.

BARGON COMPOUND RAIL CO., Aug. 19. Capital stock, $1,000,000. Directors—V. D. Moody, F. Chappellet, W. F. Boardman, A. P. Starr and F. K. Shattuck of Oakland, A. T. Hatch of Suisun and F. McLaughlin of Oroville.

TIME-SCHEDULE ADVERTISING & PUBLICATION CO., Aug. 18, Capital stock, $50,000. Directors—W. T. Allen, W. D. Sanborn, D. W. Hitchcock, W. H. Hurlburt and J. P. Needham.

AMERICAN INDICATOR & IMPROVEMENT CO, Aug. 20. Capital stock, $2,000,000 Directors—A. B. Spreckels, F. S Samuels, B. J. Hoffacker, T. O. Gruenhagen and M. H. Weed.

EL ALUMINA CO., Aug. 20. Object, to mine and mill certain mineral substances and ores. Capital stock, $100,000. Directors—C. P. Thore, A. A. Hoyt, C. K. Bonestell, H. S. Bridge, W. F. Gibson, W. R. Mould, L. F. Miller.

WASHINGTON COAL & LUMBER CO., Aug. 10. Location, Oregon and Washington Capital stock, $1,000,000, Directors—C. E. Eliot, W. T. Halliday, W. S. Eliot, J. D. Marsh, O. H. Hirshberger and J. L. Davie.

WARWICK M. CO., Aug. 22. Capital stock $400,000. Directors—Martin Jones, P. C. Mosebach, J. Henderson, S. Gardner, O. Woodhams.

SAN DIEGO M. CO. Capital stock, $400,000. Directors—Martin Jones, P. C. Mosebach, J. Henderson, S Gardner, O. Woodhams.

COMBINATION HAT AND PILLOW CO., Aug. 22. Object, to manufacture a peculiar kind of cap, which can be used as a pillow to sleep upon also, and in case the wearer should fall overboard the cap can be used as a life-preserver. Capital stock, $100,000. Directors—C. K. Bonnestell, P. S. Atherstone, J. C. Smith, Leon Nordman and C. H. Kimball.

DURROW WELL CO., Aug. 25. Capital stock, $200,000. Directors—G. W. Durbrow, J. Birmingham, O. E. Brady, H. Durbrow and Wm. Pierson.

UNIVERSAL ADVERTISING CO., Aug. 25. Capital stock, $500,000. Directors—C. E. Larrabee, H. F. Larrabee, Thos. F. Garber, Geo. W. Lewis, C. L. Colvin, H. A. Acker and H. G. Locher.

MECHANICAL PROGRESS.

Machinery and Hand-Power.

Hand-power was the primitive motor. It was equal to its task. The supple hand supplied the wants of man. That was enough. The product was ample and the producer busy. As population increased and civilization developed new conditions, the hand of labor was not equal to the wants of man. Invention became a necessity; machinery was industrial salvation. It supplemented elbow-grease and perspiration. Its introduction was gradual. It had its limits. The pump did not exhaust the well. The fever of getting rich was not epidemic, and patent laws were unknown. In the normal process of industrial evolution the hoot and the foot were on good terms, and it was not till number six men with number nine ambitions got on the top rail of the industrial fence that the inventive brain became a bottle of brandy and went into hysterics. Machinery was used without any regard to the displacement of labor and empty stomachs. Labor recoiled from these new conditions, and we read of riots and rebellion, and what to us today seems to be unreasonable and anarchical hostility to machine work. The masses were not to blame, in a logical sense. They saw the sky through a gimlet-hole, and measured the future by the tape line of to-day. They made a mistake, but it is understandable if we put ourselves in their wooden shoes and weigh out an ounce of bread to a pound of appetite.

Machinery, through the old eye-glasses, meant overproduction, cheap wages, rags, hunger and idleness. Such was the logic of the times, and the reason why so much of hostility pervaded the industrial world toward anything and everything that displaced the old motor of hand-power. Time has pulverized the old argument and reversed the original conditions. Invention has lifted us out of a deep hole, and machinery bridged the stream we could neither swim nor leap.

The steam engines in England alone could now do in 18 hours what it took the ancient Egyptians 20 years to accomplish with 100,000 men; and the spinning machinery in Lancashire can do in one year as much work as 21,000,000 persons in the same time could do with the old distaff and spindle. This tremendous power has been reached by degrees. It was not instantaneous but gradual, and if monopoly and the lust of money went at a gallop, the supreme power at the back of all forces put a bridle on the wild ass.

In the textile manufactures, which represent the most colossal of all modern enterprises, we get the fly-shuttle, the drop-box, the spinning-jenny, the water-frame, the power-loom, and the steam engine. Each of these inventions was opposed at its inception—it was another mouse to nibble at the poor man's cracker, and the torch and brickbat were used to intimidate the progressive manufacturer. But few men to-day have so little intelligence under their hats as not to see that with multiplied inventions have come new and increasing industries, and mechanical skill has not emptied the bag of flour, but doubled the grist at the mill. The industries of civilization increase with its inventions, and where science discovers a force in nature, its utilization is not a brake on the industrial wheel, but an additional seat in the coach and a new horse in the harness.

The electric light may dispense with the old lamp-lighter, the locomotive may halt the stage-coach, and the screw propeller may strand the old-time brigs and galleys, but the displacement of industrial methods and forces have not reduced the chances of employment, nor left the multitudes with little to eat and less to do.—*Artisan.*

How to Tin Tools.

Tools or other apparatus of iron or steel, even highly tempered steel, may be easily and cheaply coated with tin, which will give them an appearance almost equal to nickel plate and effectually prevent them from rusting. The tool should be made quite smooth and the rust, if any, removed by the use of emery paper, although this is not necessary except for the appearance. A dipping solution, consisting of tinners' soldering fluid, to which a little sal-ammoniac has been added, will be required.

An iron pot or ladle, in which the tin is to be melted, will be necessary, and must be of sufficient capacity to hold enough melted tin to cover the article.

The solution may be made by taking about five cents' worth of muriatic acid and adding to it as much sheet zinc as it will dissolve, then adding an equal bulk of water. A piece of sal-ammoniac as large as a hazel-nut should then be dissolved in the solution. When this is prepared, melt the tin and place the object in it until it becomes hot. This will not injure the temper of any steel tool, for the melting-point of tin is less than the heat required to draw the temper of any kind of steel tool. When the article has become so hot that no unmelted tin clings to it, plunge it into the solution for an instant and then into the melted tin again. In removing the article from the solution to the tin, care should be taken that the hot tin does not spatter on account of the wet article being too suddenly immersed in the melted metal. As soon as the article has attained the same temperature as the tin, it may be removed and the surplus metal wiped off with a stiff brush or any convenient material, when it will be found to be nicely and completely coated with tin, giving it an appearance nearly equal to that of a nickel plate. A hand-hammer may be neatly tinned in this manner without injury to the handle.—*The Stationary Engineer.*

THE BANDSAW FOR CUTTING METALS.—English mechanics, says the *Western Machinist*, are said to depend much upon a tool which is but little used in America, namely, a handsaw for metals. Its construction, as described, is similar to that of a heavy handsaw, with a third carrying-wheel for the saw, the object of this being to remove the up-moving side of the blade from the vicinity of the table, and thus leave a deep throat through which a large piece of work can be passed or a wide plate turned. This third wheel is placed at the back of the machine, about midway in the vertical light of the saw blade; the temper of the saw is slightly harder than that of those used for wood, and the teeth are sharpened straight across the blade by a cutter with its teeth at the right hight to suit the teeth of the saw blade. This tool is used for cutting off the spines from steel castings, the ends of bolts, to saw up steel, iron and copper plates to any form, and to rough out the jaws of eccentric rods and other forgings which would require the use of slotting machines, and it cuts as well on a circle as upon a straight line. The blade is lubricated with soap and water, and in a cut six inches long through a steel connecting-rod jaw it works freely and satisfactorily. Not infrequently circular saws of large dimensions are used for the same purpose, and, being mounted on heavy frames and fed carefully up to their work, cut off large pieces of steel, leaving nearly a smooth surface on the face of the cut.

SHAPING METALS BY ELECTRICITY.—Mr. Herman Lemp has patented a device for forming or shaping pieces of metal when rendered soft or plastic by an electric current. In carrying out the invention it is proposed to use a transformer provided with a secondary of very low resistance, so as to produce a current of great heating volume. The terminals of the secondary are brought adjacent to each other and provided with clamps, one of which is arranged to slide to or from the other. The piece of metal to be operated upon is secured by the clamps at its ends, and the primary circuit of the transformer thrown into connection with an alternating current circuit. The bar of metal is soon heated to plasticity, when the sliding clamp is withdrawn, thus rupturing the metallic bar being operated upon. A die is then placed over the plastic ends of the bar and the sliding clamp is forced inwardly so as to drive the heated ends of the bar against the face or faces of the die, thus producing a swaging action on the softened metal and causing the same to assume the form of the die. The advantages claimed for this invention are great expedition of manipulation.

NOVEL GERMAN INVENTION.—A Berlin inventor has devised an elevator which is said to be simple and inexpensive. It is described as follows: It is on the principle of an inclined railway, and the motive power is furnished by water, which is applied in the cellar; each flight has its separate chair, so that, for example, one person can ascend from the first to the second story while another is on his way from the second to the third, or still another is descending from the fifth to the fourth. The chair, being only the width of the human body, requires but little space, and still leaves a free passage for any who wish to walk up or down instead of riding. It is set in motion by a simple pressure upon one of its arms, while after it has been used it glides back to the bottom step, its descent being regulated in such a manner that the carrying of a passenger is a matter of entire safety. The motive-power is, of course, more or less expensive, according to the cost of water.

HARD AND SOFT EMERY-WHEELS.—Hard, close grain emery-wheels do not cut so rapidly as soft, loose ones, from the fact that the particles in the hard stone are more compact, and the edges wear slightly before breaking, while in the soft wheel the cement wears first, and more rapidly, presenting new cutting edges to the work, which, when but slightly worn, will pull out of the wheel on account of this increased friction surface, freeing sharp edges replacing them. This is proved by the fact that the fastest cutting wheels are the softest.

CRUSHED STEEL.—This material is said to be coming into use for cutting stone. It appears to be made by quenching very high-carbon steel in cold water from an excessively high temperature, such as would overheat steel for most purposes. This renders it not only hard but rather brittle, so that it is possible to pulverize it; it is crushed in a stamp-mill and sifted closely to size. It is said to be not only cheaper but much more effective than emery, giving a better and quicker polish and lasting much longer.

HEAVY LOCOMOTIVES.—The Baldwin Locomotive Works of Philadelphia have recently completed, or are now building, locomotives weighing 75 tons each for the Northern Pacific and other railroads. The only obstacle to the immediate introduction of these engines on many roads is the insufficient strength of the bridges.

SCIENTIFIC PROGRESS.

Photographs and True Art.

The Washington *Post* says that the instantaneous photograph bids fair to become a very potent aid to artists who seek to teach their pupils that reproduction is not art; for it is clearly demonstrated by this means that the real is in nowise like the apparent. For example, an instantaneous photograph of a man in the act of running never looks as much like a man in the act of running as the pen drawing of a true artist does. The reason is that the photograph reproduces the one exact position of the runner at the instant the picture is made, while the artist pictures several positions in one and makes his man appear to be moving. Art always has dealt and always must deal with things not as they are, but as they seem to be. We sit and look at a runner. He seems simultaneously to bend forward his body, throw one leg away forward and the other far to the rear, with both knees at almost an acute angle. At the same instant he seems to swing one arm forward while the other is drawn back, both being "shut" tightly at the elbows. So it seems, for the eye of the observer is not keen enough to see the position of each instant separately; it sees the position of a group of instants, and the observer thinks that these positions are simultaneous. The instantaneous photograph shows that they are simultaneous, and in doing this presents a picture that does not look like a man in the act of running. This photograph is going to be—indeed already is—a great aid to science, but the only thing it can do for art will be to prove that really it does not seem as true as the ideal. What is true of the painter's and the sculptor's art is also true of the writer's. He who describes things as they really are may be a scientist, but only he who describes things as they seem to be is an artist. We frequently hear readers say of characters created by an artistic writer that they have seen just such persons. They think they have, but they haven't. It is the writer's art that makes them think they have. If he actually described the persons they have in mind they would say there never were such beings on earth. Thus it comes about that "truth" (reality) is stranger (because less commonly observed) than fiction, and that "fiction (the ideal) hath a nobler end than fact."

Double Stars—The Star Mizar.

Every observer of the heavens is familiar with the constellation called the Great Dipper, visible in the northern sky through the whole night and throughout the year. An interesting discovery has recently been made by Prof. Pickering, of the Harvard University observatory, concerning one of the stars of this beautiful group. It is the middle star in the handle, and is called Mizar, is of the second magnitude, and has attracted much attention because even to the naked eye it is double. It has a companion, Alcor, which is of the fifth magnitude, and is plainly visible to observers endowed with good visual power. The tiny star seems to be growing brighter, for the Arabians considered it a severe naked-eye test, and it is now comparatively easy to detect. The telescope shows plainly that Mizar is a double star, its components being of the third and fifth magnitudes, the one a brilliant white, the other a pale emerald.

The recent discovery of Prof. Pickering is the fact that the larger star of the pair is also double, the two stars that compose it being so close together that the telescope cannot separate them.

The Spectrum of a Star.

Like the solar spectrum, consists of the seven primary colors, crossed by dark lines. These lines form a kind of astronomical alphabet. If the star is coming toward us, they shift toward the violet end of the spectrum. If the star is receding, they shift toward the red end. Two stars very near together, having the same spectrum, cannot be distinguished from a single star as long as they are at rest. If they revolve round each other in a plane inclined to the line of sight, the lines of their spectra will be single when the stars are in conjunction and double when they are at elongation. This is the case with Mizar, and the doubling occurs at intervals of 52 days. Prof. Pickering, therefore, infers that these two stars are immense suns revolving round each other. He estimates that the period of revolution of each sun about the common center of gravity is 104 days, and that the maximum velocity is 100 miles a second. These conclusions are the result of measurements of almost inconceivable delicacy.

FIRE FROM STEAM PIPES.—In an article on the danger of fire from steam pipes in a German paper, it is said that after wood has remained a long time in contact with steam, hot-water or hot-air pipes, the surface becomes carbonized, and during warm weather the charcoal absorbs moisture. When the moisture is driven off, it leaves a vacuum into which the fresh-air current, circulating around the pipes, rapidly penetrates and imparts its oxygen to the charcoal, causing a gradual heating and eventually combustion.

THE ADVANCEMENT OF SCIENCE.—The 39th annual meeting of the American Association for the Advancement of Science commenced its session at Indianapolis on the 20th instant. Over 200 members were present, in addition to a great number of interested visitors. The Governor of the State, most of the State and city officers, and the members of the Indiana Academy of Science were in attendance. This association has met with a rapid growth, and is regarded as one of the most active and useful associations for the advancement of science in existence. It grew out of an association of American geologists and naturalists which was organized 50 years ago in Philadelphia. The scope of that association was enlarged and its name changed in 1849, so as to embrace work in all departments of science. At its reorganization its membership was only 461, which number grew but slowly for 20 years, numbering only 668 in 1871. Since that time the growth of the society has been much more rapid. It has now an enrolled membership of something over 2000, of whom fully one-half will probably be present at some time during its present session. The association is divided into eight sections, devoted to as many specialties. Prof. Goodale of Harvard University is president for the current year. Up to this present writing we have seen no report of any of the papers read, of which no less than 200 are expected to be presented.

THE BUSINESS OF PACKING is gradually being reduced to a kind of scientific form, including not only the careful and proper manner of putting up packages, whether large or small, but also their handling, transportation and delivery. It has been found that steamers will carry some 20,000 packages, as they generally run—boxes, barrels, crates and baskets. Much study is being given to the most close connection of ship and car. There is probably no port in the world where this business is closer studied than at Baltimore, where, in addition to freight cars and steamers, there are innumerable wagons on land and flotillas of little craft in the water. Schooners of from 300 to 400 tons, sloops of from 30 to 40, are continually arriving with oysters in winter or with vegetables in summer. The dock workmen and most of the dock hands are colored. Norfolk and its environs furnish employment for 30,000 men in this industry during the busy season.

THE GREAT ANTIQUITY OF WEAVING.—An examination of the textiles from the German peat-finds of the northern bronze period has enabled Herr Buschan to distinguish the fibers of the stuff, and to show that, at a period of great remoteness, wool and flax, but not hemp, were made into webs. The folk of the lake dwellings could manufacture flax into coarse lace, nets, mats and even embroidery. Herr Buschan holds it proved, by the instruments discovered, that they could knit and weave in the Neolithic period, when mighty mammoths were roaming over Europe, and when England harbored the musk ox and grizzly bear.

A NEW ALUMINUM PROCESS.—M. Minet has placed before the French Academy of Sciences a process of extraction of aluminum by electrolysis of a fluoride of this metal in a molten state. He employs an electrolytic bath composed of chloride of sodium 60 grammes, double fluoride of aluminum and sodium 40 grammes. He gives various details of the method of procedure. He produces by this method 21.5 grammes of aluminum for an expenditure of one-horse power hour, and 30 grammes might be obtained in actual practice.

GERMS OF CHOLERA INFANTUM.—Dr. Vaughan of the University of Michigan, who gave to the world his discovery of tyrotoxicon—the poison which exists in milk, cheese and ice cream—claims now to have isolated three poisons which were obtained from the germs of cholera infantum. Both this disease and typhoid fever are, he announces, due to alkaloid poisons, which are of the nature of ferments; and he will now devote himself to discover antidotes for them.

BUANDERINE is a new lixiviative which has made its appearance on the German market, for washing and cleaning linen goods especially, and great things are claimed for it, but whether the claims are substantiated is somewhat uncertain and very doubtful, to judge from its composition, which is given in a contemporary as 53 59 fatty acid, 12.25 paraffine wax, 7.58 soda, 1.26 alkaline sulphate, 24.96 water.

PHOTOGRAPHING THE FORMATION OF WATER DROPS.—An instrument has recently been exhibited in London by which a photograph can be taken of drops of water in the course of their formation. It consists of a lantern and lenses, by which a water-trough, the source of the drops, can be strongly illuminated, together with a lightning camera having a revolving-disk with one perforation.

ELECTRICITY FOR THE EYES.—A Portland, Or., jeweler is said to have invented a device consisting of copper and zinc adjustments to the temple of spectacles, and to the nose-piece of eye-glasses, whereby a small current of electricity is generated, materially assisted by the moisture of the skin. It is claimed that this current will strengthen the optic nerve.

A NEW ELEMENT, named "damaria," is said to have been discovered in the crater of an extinct volcano in Damaraland. It is reported to have an atomic weight of only 0 5, or half that of hydrogen, and therefore it is the lightest known substance.

Good Health.

The Kemmler Execution.—Much unfavorable comment has been made in the papers in regard to the Kemmler execution. These comments are no doubt largely due to the supposed degrading innovation which such executions may possibly engender in the minds of oversensitive persons. Such objection is senseless. The supposition on the part of some persons that the death of Kemmler was prolonged and highly painful is without reason. His taking off was without doubt instantaneous and absolutely painless. The physical distortions manifested were purely muscular, and may be produced in the same way upon any cadaver, as is well known to all medical men. If the current had been kept up for a few seconds longer, no such indications would have occurred, unless the current had been turned off and then turned on again, which would have been an unnecessary thing to do. The current should have been passed through the body by way of the two hands properly moistened and secured in the circuit. Everything about that execution, when properly considered, shows that it was certain, humane and in every way proper. It has proved that the traditional and barbarous gallows should be consigned to oblivion.

Mistakes.—It in a mistake to labor when you are not in a fit condition to do so; to think that the more a person eats the healthier and stronger he will become: to go to bed at midnight and rise at daybreak, and imagine that every hour taken from sleep is an hour gained; to imagine that, if a little work or exercise is good, a violent or prolonged exercise is better; to conclude that the smallest room in the house is large enough to sleep in; to eat as if you had only a minute to finish the meal in, or to eat without an appetite, or to continue after it has been satisfied merely to please the taste; to believe that children can do as much work as grown people, and that the more hours they study the more they learn; to imagine that whatever remedy causes one to feel immediately better (as alcoholic stimulants) is good for the system, without regard to the after effects; to take off proper clothing out of season because you have become heated; to sleep exposed to a direct draught; to think any nostrum or patent medicine is a specific for all diseases.

What is True Life?—The mere lapse of years is not life. To eat, and drink, and sleep—to be exposed to darkness and to light—to pace round in the mill of habit and turn thought into an implement of trade—this is not life. In all this but a poor fraction of the consciousness of humanity is awakened, and the sanctities still slumber which make it worth while to live. Knowledge, truth, love, beauty, goodness, faith, alone can give vitality to the mechanism of existence. The laugh of mirth that vibrates through the heart, the tears that freshen the dry wastes within, the music that brings childhood back, the prayer that calls the future near, the doubt which makes us meditate, the death which startles us with mystery, the bardship which forces us to struggle, the anxiety that ends in trust, all these are the true nourishment of our natural being.—*James Martineau.*

Marriage with Drunkards.—The efforts to raise the poor and degenerate inebriate and his family are practically of no value as long as marriage with inebriates is permitted. Recently the Legislature of the State of Victoria, in Australia, has passed a law which gives a wife the right of divorce if the husband is found to be an habitual drunkard. If after marriage she discovers that he is an inebriate, she can also get a divorce. The husband can do the same with a wife if she is proved to be an inebriate. This is a clear anticipation of the higher sentiment which demands relief from the barbarous law which would hold marriage with an inebriate as fixed and permanent.

For Sleeplessness.—It is claimed that the most potent and most perfect remedy for sleeplessness is to drink hot water. If one awakens in the night, as hopelessly wide awake as if galvanized or electrified with vital activity, an invariable remedy is a glass of perfectly hot—not warm—water. It can be heated over the gas, or over a spirit lamp, and sipped while almost at boiling heat, and one who tries it will find himself going off to sleep like an infant, and getting, too, the most restful and peaceful sleep imaginable.

Palpitation of the Heart.—Dr. Nebo (in *Journal de la Sante*) says that an excessive palpitation of the heart can always be arrested by bending double, with the head downward and the hands pendent, so as to produce a temporary congestion of the upper part of the body. In almost all cases of nervous or anemic palpitation, the heart immediately resumes its natural function. If the respiratory movements be suspended during this action, the effect is only the more rapid.

Heart Disease from Over Exertion.—A warning against undue physical exertion by those not accustomed to it is contained in the remark of the chief surgeon of the National Soldiers' Home at Dayton, Ohio. This physician said that of the 5000 soldiers in the home "fully 80 per cent are suffering from heart disease in some form or another, due to the forced physical exertions of their campaign."

Engineering Notes.

New Route Across the Atlantic.—An Ottawa, Can., dispatch states that a company of Boston, Mass., capitalists have been quietly developing the foundations of a seaport at the east end of the Straits of Canso, N. S., and if expectations are realized it will have an important bearing upon future communication between Europe and America. The place, which is to be called Terminal City, is five miles east of Port Muigrave, on the Intercolonial railway, and the Government has consented to an extension of the railway to the place, and agreed to operate the extension as part of the Intercolonial system. Terminal City is situated on one of the finest harbors on the Atlantic Coast, having sufficient depth of water for the largest vessel afloat, being completely land-locked, absolutely free from ice, comparatively free from fog, and open to navigation at all times. A straight line on the map of the world from Chicago to Liverpool passes through this point, and the distance between them is 400 miles shorter than by Portland, Boston or New York. It will take four days from Terminal City to Liverpool by the new steamers proposed to be put on the route. When the railroad is completed and wharves are built, all passengers and mails from Europe will be delivered in New York or Montreal one day sooner than by any other route. It is the most easterly port, open all the year round, and appears to be a natural shipping port for the products of the Dominion to Europe.

High Rates of Speed.—That eminent scientist Prof. Elihu Thomson, in a recent lecture before a scientific body, declared that much higher speeds than can now be obtained with steam locomotives are to be expected by means of electricity, and he considered from 100 to even 150 miles an hour possible. He gave as a reason for this opinion the fact that while in the steam locomotive there are reciprocating parts that must be put in motion, stopped and reversed continually, in the electric locomotive we have simply a rotary motion, which makes it possible to run with economy at much higher rates of speed. He believed that if we could come back after another hundred years, we would find 150 miles an hour to be the speed of traveling, adding: "It simply depends upon finding the necessary method of applying sufficient power, and building the locomotives to suit, arrangements being adopted to keep the cars on the track." One hundred and fifty miles an hour may be among the possibilities, but probably most people nowadays would rather leave to coming generations the enjoyment of whirling through space at that frightful velocity. To leave Chicago at night and be in New York next morning would be a wonderful achievement, involving great increase of business facilities, but the safety of such a speed under present conditions may well be questioned.—*Railway Age.*

Rope Transmission of Power.—The utility of wire-rope transmission has become widely recognized. Not only among the rugged hills and mountains of the East and Far West, where streams go rushing down through caverns and rocky steeps, where no locations for mills or factories are afforded, is this means of transmission of precious power appreciated, but it is so convenient to use it that we find on the prairies of the West mills being operated at a long distance from water-powers by the wire rope. A few days ago, on a trip through Nebraska, we noticed a rope stretching for nearly a mile from a water-power to a mill that had recently been built adjoining a railroad, the owners finding it much more to their advantage to have it there, with the switching privileges afforded, than at the dam. The expense of hauling the flour which is thus saved to them will very soon pay for the system of power transmission.—*Modern Miller.*

A Novel Proposition.—A correspondent of *Indian Engineering* suggests an original scheme for smoke abatement, by asking whether it has ever been proposed to have a smoke duct running through a town, connected with the different furnaces. He suggests that such a duct might be carried outside of the city to a condensing station; an exhaust machine being employed to force the draught. At the condensing station the soot-laden air might be made to pass through water, and thus deposit the solid matter, the air passing away comparatively pure, while the soot thus deposited might easily be collected, caked and sold as fuel. The size of the duct would have to vary, as in water and other mains, according to the work to be performed.

The Manchester (Eng.) Canal, that is to give the great manufacturing city an outlet to the sea, is a gigantic undertaking. There are in use 97 steam navvies, 169 locomotives, 245 steam cranes, 130 portable engines, 211 steam pumps, 6162 wagons, 52 pile-driving engines. The steam-power amounts to 50,000 horse-power; 12,000 men and boys are employed and 160 horses; 30,000,000 cubic yards of excavation have been made, and forty-four millions of stone and earth yet to be moved.

Permission to Establish a Cable Railway on Broadway, New York, has been granted by the State Railroad Commission. The company is to repave and keep in repair the space between its tracks and for two feet each side. Grooved rails must be used as soon as possible, but permission is granted to lay tram rails temporarily, until the grooved rails can be obtained.

An Immense Traffic.—The Southeastern Railway, England, is reported as running 800 trains each 24 hours in and out of Cannon Street station, London.

Useful Information.

Utilizing Tin Cans.—The *American Analyst* gives an insight into a rather peculiar industry, the utilization of old tin cans in New York City. It says: Large numbers of tin cans of all kinds in which foods have been contained find their way via the ash barrels to the city garbage dumps. Here they are picked out and taken to a tin-can receiver, where, after the labels and dirt are washed off, the tin and solder are melted and converted into solder sticks, the remaining sheet iron being rolled flat and sold for trunk corners, umbrella ferrules, and the scrape are converted into such weights. There is no secret about the process. The only thing is to have a proper-sized furnace and to get up a sufficient heat. The business has developed of late, but manufacturers say the margin of profit is small. It costs more to melt the scraps than common iron. Chips ready for the furnace cost $7 a ton. The cash weights produced are of a superior quality. The business is, like the case of old rubber, an illustration of the use of waste material. The tin-can companies and other manufacturers of tin goods formerly dumped hundreds of tons into space, but now these scraps are utilized, and the irresponsible small boy works the ash-fields to his profit, in companionship with the blithesome goat.

Shingles, Hips and Valleys.—Shingles in valley and on hips last longer when laid with their grain running in the same direction as that of the hip or valley. When they are out on the angle, the end wood absorbs water and hastens rot, whereas the straight, close-running grain of the wood rejects the moisture more and leaves the shingles more durable. Few carpenters can now be found, except among the older hands, who are familiar with this mode of shingling, as it really is a very old yet excellent one, and yet comparatively simple, involving little or more time than the late and inferior method. All that is necessary is to taper the shingles so that they radiate, as it were, from the angle of the hip or the valley to straight joint square to the eave. Combs on ridges are scarcely to be recommended, but if they must be employed for the sake of economy, are best run up on that side on which the angle of the rain in that latitude generally falls. Wooden ridge rolls are better, and best of all is the galvanized iron cresting. Rolls and ridge boards should be nailed through the shingles and into the rafters, and not to the shingles only. Hip shingles should be cut with a saw to make a job straight.—*Journal of Building.*

The Multiplying Uses of Iron.—Iron is the gauge by which the prosperity of this country is measured to a great extent—when the price of iron is in the ascendency the country is enjoying prosperity. The great rolling-mills of the West, that a few years ago were turning out tons of steel rails every hour, are heard of no more. They are supplanted by the great foundries that are turning out hundreds of tons of castings daily for the great office buildings and stores that are now being erected in large cities. To the ordinary beholder these buildings are built of stone, brick, terra-cotta and glass, but in fact the entire skeleton is of iron or steel and all other materials are merely masks with which to clothe the monster, the buildings being constructed on the principle of a latticed girder or braced tower. The brick or stone work shown is a mere shell or architectural veneer to give the building a resemblance to its neighbors. As we are apparently only at the beginning of this new era in architecture, it is probable that the demand for iron and steel for these monster buildings will continue at an increasing rate.—*St. Louis Builder.*

Manufacture of Celluloid.—The substance known as celluloid consists usually of dissolved paper, although cotton or other vegetable fibers may be used. In the manufacture, tissue paper is treated with nitric and sulphuric acids, the product is then washed and camphor added. The mass is then ground. Coloring matter is now added and the mass is made into a paste with alcohol; it is then pressed and broken between rolls. The finished mass is very plastic and may be molded and pressed into any desired shapes, drawn into tubes, etc. All the celluloid articles sold in the United States, and in fact the bulk of all that are sold the world over, is the product of an American company's factory. The output of the company last year was valued at $1,500,000.

Charcoal.—The best quality of charcoal is made from oak, maple, beech and chestnut. Wood will furnish, when properly charred, about 20 per cent of coal. A bushel of coal from hard wood weighs 30 pounds; 100 parts of oak will make 23 of charcoal; red pine, 22.10; white pine, 23.

The Growth of Canada.—The population of Canada is estimated at 5,000,000, an increase of nearly 700,000 in ten years. A hundred years ago the population of the United States was 3,929,000; of Canada, 156,000. In 1861, British Columbia had 6000 people; in 1881 the population was 49,459. These figures show that Canada has grown proportionally at a faster rate than the United States. She has increased 32 fold, while the United States has increased only 16.

To Remove the Smell of Paint.—The best way to remove the smell of paint is to first render the room as nearly as possible air-tight by closing the windows, doors and other openings. Place a vessel of lighted charcoal in the room, and throw on it two or three handfuls of juniper berries. After 24 hours the smell will have entirely disappeared. Another method of doing the same thing is to plunge a handful of new hay into a pail of water and let it stand in the newly painted room.

The First Mechanical Invention.—On Thursday, July 31st, occurred the one-hundredth anniversary of the issue by the United States Government of a patent for a mechanical invention. The patentee was Samuel Hopkins, for a process for making pot and pearl ashes. The number of patents issued during the first century of the nation's existence was 433,432, and still they multiply.

Gilt Picture Frames may be brightened by taking sufficient flour of sulphur to give a golden tinge to about one and one-half pints of water, and in this boil four or five bruised onions, or garlic, which will answer the same purpose. Strain off this liquid, and with it, when cold, wash with a soft brush any gilding which requires renewing, and when dry it will come out as bright as new.

Whale Glue is a new article of commerce. It is being manufactured on the Russian island of Jeretike, from the jelly remaining on extracting the train oil, by means of superheated steam. It is sold in the form of jelly containing chemical preservatives.

The Deepest Bore Yet.—It is reported that a depth of over 5200 feet has been reached in boring at Schladerbach, near Halle, by some Prussian mining engineers.

A Pleasant Household Deodorizer is made by pouring spirits of lavender over lumps of bicarbonate of ammonia.

California Quicksilver.

The production of quicksilver in the United States has been made the subject of investigation by the Census Bureau, and a special report is about to be issued.

The statistics have been prepared by J. B. Randol, under the supervision of Dr. David T. Day in charge of Mines and Mining, 11th Census. No similar statement was published as a part of the last census, so that comparisons cannot be well made.

During the calendar year 1889 there were 26,464 flasks, or 2,024,496 pounds of quicksilver produced in California. About 20 flasks, less than $1000 in value, were produced in Oregon.

There are 11 productive mines in California with 36 furnaces. The productive mines and active furnaces employed 937 operatives, of whom 416 were engaged on surface work, and 521 were employed underground. The number of tons of cinnabar ore mined in producing the quicksilver was 95 714. The expenditure was $219 622 for supplies and $526,289 for wages. The average cost per flask of quicksilver produced ranged from $65.70 to $21.66, the average cost for all being $33 31.

The active establishments employed 62 steam motors, with a capacity of 2190-horse power; 54 boilers, of 2438-horse power; one electric dynamo and motor of four-horse power, and one water-wheel of three-horse power, a total of 2197-horse power in motors. Two hundred and forty-seven animals were also reported as employed, but it is probable a greater number were in use.

The total capital invested in the 16 establishments is stated at $1 331,114, of which $680,470 is in mines and real estate, $222,300 in furnaces, houses and other surface improvements; $146,150 in machinery, supplies, tools and live-stock; $124,075 in quicksilver unsold; $34,644 in bills and accounts receivable, and $125,456 in other assets.

The following is the production of quicksilver throughout the world for the last ten years, in flasks: United States, 407,675; Spain, Austria and Italy, 685,936; grand total, 1,093,611.

Comstock Miners.—The force of miners employed in the Comstock mines at the present time is between 1200 and 1300 men. Taking the carpenters and top hands, there are about 1500 men employed in and about the mines of the old lode. Figuring this force at $4 a day, though carpenters receive $5 a day, the monthly pay-roll would foot up $180,000, which is just about what the *Enterprise* figures it at monthly, exclusive of the mills.

Work has been commenced on the Knight's Landing levee extension. Other levee work near Marysville will be done in the next few weeks.

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[NEW THIS ISSUE.]
Pumping, Hoisting and Quartz Mill Machinery for Sale—Risdon Iron and Locomotive Works.
Gas or Gasoline Engines—Pacific Gas Engine Co.
Books on Mining and Irrigation—E. & F. N. Spon, New York.
Free Milling Gold Mine Wanted—"Bona Fide."
Assessment Notice—Gray Eagle Mining Company.
See Advertising Columns.

Passing Events.

The official trial of the new cruiser San Francisco this week was in every way satisfactory, and will result in quite a handsome bonus to the local builders, for the increase in speed. The building of these fine vessels in this city shows what can be done by our mechanics and shops when they have the opportunity.

The molders' strike is still on. There has been some talk of arbitration, but the foundrymen say they have nothing to arbitrate. They have plenty of non-union men in the shops, and continue with their work in the ordinary way.

Congress is still tinkering with tariff matters, and this week has been considering lead and lead ores, nickel, mica and other like substances.

The action of the Mining Stock Association, in bringing suits against the directors of certain mining companies to return certain large sums of money lost to the companies through their acts, may in the end lead to a better condition of affairs in mining-stock circles.

THE monthly pay-rolls of the mines and ore-reduction works in Butte City, Montana, and its suburbs aggregate $710,000. The total number of men employed is estimated at 7000.

Comstock Mine Management.

In several articles of late the MINING AND SCIENTIFIC PRESS has called attention to the peculiar methods and manipulations connected with the milling of ores from the Comstock mines, by which the mill-owners and not the mine-owners get the most of the profits from the ores while outside stockholders pay assessments to keep up the system. It seems that at last the matter will be ventilated in the courts. Mr. M. W. Fox, chairman of the Executive Committee of the Mining Stock Association, has addressed a letter to the Directors of the Hale and Norcross M. Co. stating that he is a stockholder and that he believes the stockholders have been deprived of some $2,000,000 in the past three years by the acts of the directors in forming a combination with the owners or lessees of the mills. He then goes on to describe how the value of rich ores had been reduced to a low average; how even then only half the average value was returned by the mills, and how many thousands of tons of ore not worth the cost of extracting were extracted and milled, etc.

Mr. Cox concludes his letter as follows:

I am prepared to furnish sufficient evidence to prove the above charges, and therefore demand that you institute an action in the proper court and in the name of the Hale and Norcross Silver Mining Company to compel a restitution of the property, and for a judgment against each and all of said conspirators for the full amount of said loss.

And I further demand that you at once cease from further co-operating with said mill-owners or lessees in said fraudulent conspiracy and combination, and return to the treasury of the Hale and Norcross Silver Mining Company all the moneys and property you and each of you have received as your portion of the profits of said fraudulent scheme.

It is stated that if the Hale and Norcross directors fail to put the above request in force, then action at law will be instituted. We are informed that this suit will be followed by similar actions against several other Comstock mining companies. These suits will be largely based upon charges heretofore published in these columns.

The Mining Stock Association has employed W. T. Baggett, a prominent lawyer of this city, to file suits against the directors of the company and the mill-owners, asking for the return of the property and to urge the Attorney General of California to institute criminal proceedings against all concerned in the alleged misappropriation. These suits are to be commenced within a few days.

The officers of the Mining Stock Association say they are in a position to prove that large amounts of ore were of a much higher grade than reported to stockholders. They also state that bullion from the mine has been taken into the Carson Mint at night in a secret manner. These are very serious charges which the directors of the Hale and Norcross must meet. Of course if they are not true, then the officers of the Mining Stock Association will be apt to have some libel suits on hand.

Water-Power and Electric Transmission.

It has only been about two years since the attention of mine operators was first called to the practicability of electric transmission of power and the great advantages of substituting by this means water-power for steam where it could be had within any reasonable distance, and where the conditions were such as not to admit of a direct application.

For readers are perhaps not all aware of the interest that has been awakened in this subject, and the rapid progress made in its development. Comparatively few of the mining States have such an endowment in the way of rivers and streams as Colorado, and these, in the majority of cases, afford sufficient head to give, in connection with the Pelton wheel, great possibilities in the way of power, and so far Colorado leads all the country in enterprises of this character.

We gave, some months ago, a description of the Roaring Fork plant at Aspen, which is producing by means of eight small Pelton wheels some 1400 H. P., distributing it to the surrounding country for both power and light. This plant has now been in operation something more than a year, and it continues to work most satisfactorily. Since that time many other installations of a similar character have been made in that State, among which may be mentioned that of the Aspen Mining Co., consisting of four Pelton wheels, running under 50 feet head, with a capacity of 200 H. P., the power from which is transmitted some three miles by Thomson-Houston generators, running pump, hoist, tramway, etc. This plant was started up some three months ago, and is reported in every way satisfactory in result.

One of the most recent installations of this character is that of the Caroline Mining Co. of Onray, Colorado. This plant, now in course of construction, consists of two Pelton wheels of a capacity of 400-horse power to run under 525-feet head, and to operate United Edison dynamos, the power of which is to be transmitted 3½ miles to the mine through two strands of 00 wire ground return. The machinery to be operated consists of a Knowles pump with a 750-feet lift, 30-horse power hoist, 100-ton concentrating mill and a sawmill.

With such evidences of progress in the practical application of this means of transmission, no one need hesitate to adopt it with conditions any way favorable to its success. The Pelton wheel affords so many advantages, not only in the matter of high efficiency, but facility of adaptation to varying speeds and pressure, that it seems to be specially adapted to this class of service, and has therefore been generally adopted for electrical work.

Successful Trial of the Cruiser.

The cruiser San Francisco, the latest war vessel built by the Union Iron Works of this city, has for some weeks been making short preliminary trial-tests, but the official speed-test was not made until Wednesday, in the Santa Barbara channel course. The vessel got under way early in the morning, and steamed in a southeasterly direction about ten miles below the southern end of the course. She then turned and started toward the course, gradually increasing her speed. The course was determined entirely from shore bearings, which had been previously placed in position. About 7:30 o'clock the San Francisco was drawing to the line which marked the commencement of her trial. Her engines were making over 100 revolutions, and everything was in readiness to give her a fair start. At 7:41 she entered the course and started on her four-hour run. The first four miles of the course was run over in a little more than 12 minutes—almost a 20-knot pace. This rate of speed was maintained during the whole run of 40 miles, and after a run of two hours one minute and thirteen seconds the cruiser crossed the northwestern line, a minute and a fraction being the trifling time that prevented her from making the whole distance at a 20 knot rate.

On the trip up the channel the engines had averaged from 126 to 129 revolutions, but as soon as the cruiser turned in a large circle without diminishing her speed and had struck into the course again, 15 minutes later, she was immediately forced a little more, and at one time a maximum of 131 revolutions was reached, and the vessel was driven through the water at very great speed. At this time a slight accident occurred. Water got into one of the chambers, through which a current of air is fanned into the furnaces for the purpose of producing a forced draft. Consequently the water was being forced into the ash-pan and then into the fire, and it was necessary to stop one of the fans for some time until the chamber could be cleared of water. When the fan was stopped the draft was accordingly shut off to a certain extent and the steam ran down, which caused considerable loss of power for some time.

Some minutes were lost by this accident, reducing the average speed. The maximum speed was about 20 knots. The actual time consumed in making the 80 nautical miles, not including the turning time at the farther end of the course, was 4 hours, 5 minutes and 57 seconds, or practically 4 hours and 6 minutes, being only six minutes over the time which would have given her a 20-knot record.

The actual speed averaged during the run of 80 miles was 19.516, being 16-100 of a knot less than the record of the Philadelphia. During the entire run, with the exception of the trifling accident already mentioned, there was not a slip in any part of the machinery, and the fire-room and engine-room were comparatively comfortable.

The trial board has forwarded a dispatch to Washington stating that the average speed of the San Francisco was 19 7-10 knots.

Blue Gravel in Siskiyou County.

We had a call the other day from Mr. C. B. Jillson, formerly of Forest City, Sierra county, and one of the original developers of the famous Bald Mountain gravel mine. He is now working a gravel mine called the Blue Gravel, about one mile and a half from Henley and two miles from Hornbrook station, Siskiyou county. Upon a visit to that section a few years since, he became convinced from his experience in working ancient channels in Sierra county and elsewhere, that similar deposits could be found there, for plenty of gold had been found in the modern rivers. For a nominal sum he bought the ground he is now working. He then set to work to run drifts, obtain water rights, etc. He built seven miles of ditch and some flumes, and has now some 800 inches of water for three or four months, and somewhat less before and after.

The preparatory work on the claim has taken about two years, and this is the first season that gold has been produced. With a light head of water, the last four weeks' run paid 33½ cents per cubic yard of earth moved, and 55 cents for every superficial foot of bedrock stripped. Mr. Jillson showed us a fine retort of $3200 value and about $1000 in coarse gold nuggets, all well water-worn and plain channel gold. The dump is into the Klamath river, and there is no farming going on below to interfere with the mines.

Mr. Jillson says this is the first work on an ancient channel in that section of country. The placers were known at an early day, and the Klamath river, immediately below his mine, was very rich. Above the confluence of this channel, there is not a color in the Klamath for a long distance. It is a new departure entirely. The ancient channel, Mr. Jillson says, is traceable for 20 miles north. It is capped by sandrock. Some bunches of lava are found, and east of the claim there are great quantities. There is a large tract of this mining ground. There are only two locations near by. The Extension Co. on the north are sinking on the west rim and getting good prospects. It is not clean quartz gravel, but a conglomerate. The rim is very plainly defined. They have not gone fully across yet, but suppose the width from rim to rim to be about 1200 feet. The sandstone sets right down on the rim.

The river below this point was rich, but above there was nothing. The early miners took out the placer gold and quit without finding its source. Most of the settlers near by are stockmen. This claim is hydraulicked with a 3½ inch nozzle on a 13 inch pipe. Some of the ground will be drifted. The tunnel will be about 500 feet long for the drifting work.

Copper.

The French syndicate, or Societe de Metaux, which made the attempt to corner the copper of the world and failed so disastrously, sold last month the balance of the copper they had except 2000 tons, which is subject to litigation. The French bankers had made advances on the stocks of the syndicate, and they sold the copper to recover these advances. The reduction of the quantity of copper held on account of this famous syndicate from 179,000 tons to little more than 2000 tons in the course of 16 months—the value in the meantime advanced about $100 per ton—shows not only good management on the part of the vendors, but also to what a low ebb stocks held by consumers in all parts of the world had been reduced. The enormous consumption of copper during this period was also largely due to the greatly extended use of copper wire for electrical purposes, and of sulphate of copper for the prevention of disease in vines. As far as can be learned, the manufacture of sulphate of copper will probably absorb 20,000 tons more copper this year than last.

Last month the arrivals of copper in England were 1462 tons from Chili and 2210 tons of fine copper from the United States. A curious feature of the market was the reshipment of 400 tons of ordinary Anaconda (Montana) copper matte to New York from Liverpool, while in the same month that mine shipped to Liverpool 2950 tons of argentiferous copper matte.

The statistics of James Lewis & Sons' Liverpool report show that while the supplies of cop-

per to England and France for the first half of this year have been 3319 tons less than for the first half of last year, the consumption and export have been 33,444 tons, or more than 50 per cent greater. The stock of copper in both countries on the 30th of June, this year, was 39,896 tons less than on the same date last year, or 69,481 tons against 109,377 tons.

The United States continues to ship more copper into Liverpool and South Wales than any other country, not excepting Chili. The amount shipped for the first seven months of each year for the past six years by the United States was as follows: 1885, 14,553 tons; 1886, 9236 tons; 1887, 6010 tons; 1888, 16,530 tons; 1889, 15,276 tons; 1890, 13,898 tons. In the first seven months of 1889, Chili shipped to Liverpool and Swansea 14,653 tons, and in same period in 1890, 13,691 tons. These figures are instructive as showing the growth of our copper-mining industry, which has received its most recent impetus by the wonderful development of the Anaconda mine, Montana, owned by San Francisco capitalists.

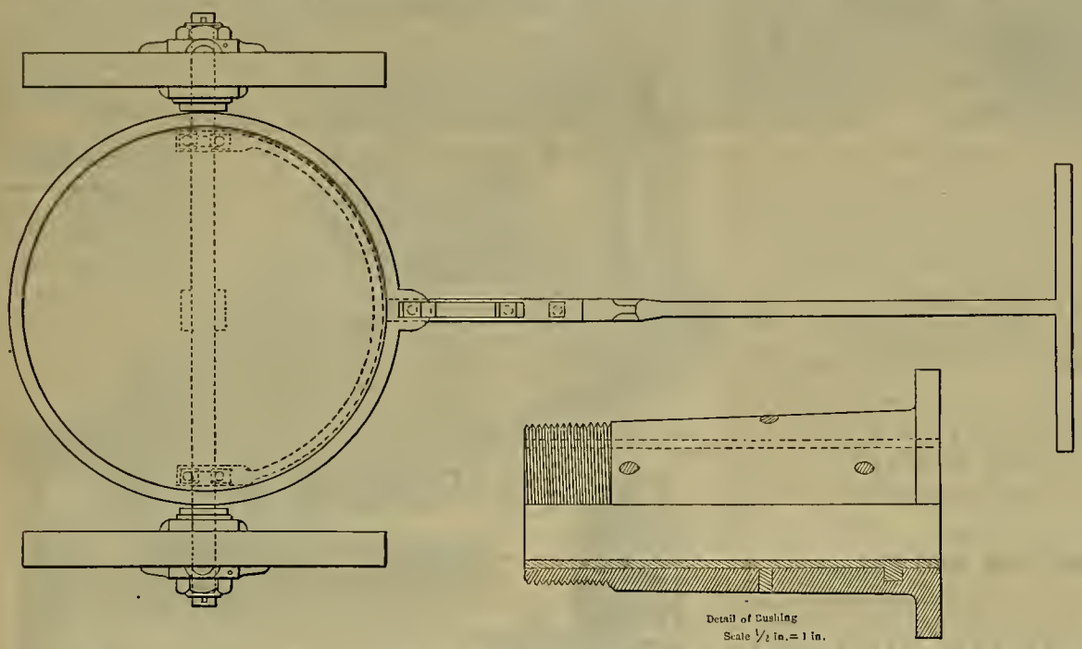

Fig. 1.—MODEL OF SLAG-POT FOR LEAD FURNACES.

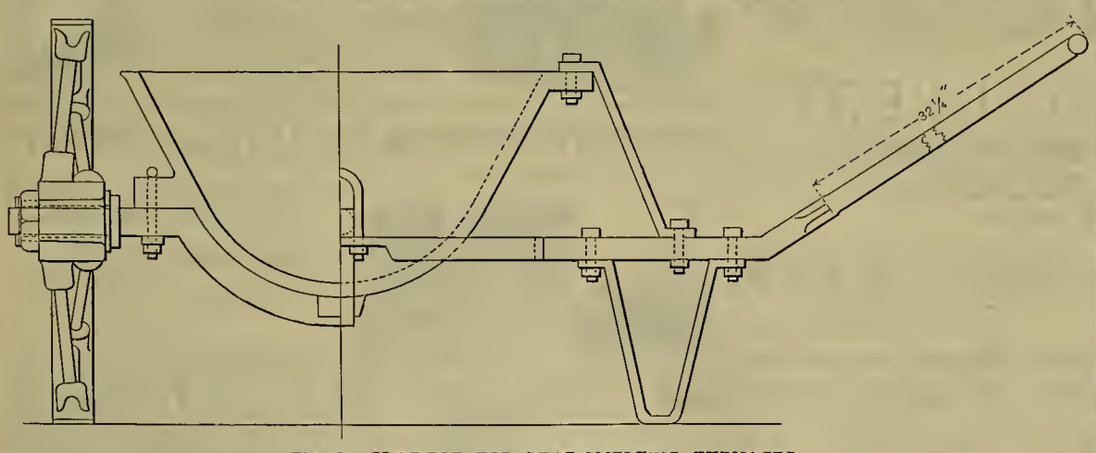

Fig. 2.—SLAG-POT FOR LEAD-SMELTING FURNACES.

Implements Used in Lead Smelting.

Mr. W. S. Keyes, the well-known mining engineer, in a chapter contributed to the last report of the State Mining Bureau, gives the following list of tools and other implements required at and about a blast furnace in lead smelting:

For the Feeder—Two D-handled steel scoop-shovels, size 8, wide mouthed. The shovel proper is 14 inches in width by 16 inches in length. Two square-pointed, long-handled steel shovels, size 3. Two napping hammers, No. 8, weight six pounds; for breaking up coke, slag, etc. One three-quarter inch rod of wrought iron, with ball for loosening up the ore. One 10-pound double-faced striking hammer, No. 52. Two bars one and one-half inch octagonal machinery steel, 10 feet long. Two bars one and one-half inch octagonal machinery steel, 11 feet long. Two bars one and one-half inch octagonal machinery steel, 12 feet long. Sundry gads, 18 inches long, of one and one-quarter inch steel, and a number of stiff brooms.

For the Weigher—One scale, 1000 pounds capacity, with a platform 30 by 42 inches. One one-wheel E barrow, for weighing up charges. One long-handled steel shovel, size No. 4. One scraper, to clean the scale platform. A number of coarse brooms.

For the Coal Passers—One coke buggy, holding about 500 pounds of coke. One large wheelbarrow, for charcoal. Two 14-tine steel coke forks. One No. 8 scoop-shovel.

For the Ore Wheelers—Two ore cars of 12 cubic feet capacity. One D-handle shovel, size 4, and a number of picks and brooms.

For the Furnace Floor—Thirteen slag-pots, 23 inches in diameter, for a 60-ton furnace. See accompanying Figs. 1 and 2, showing a model with details. Two matte or speiss pots, if such be necessary. One one-inch octagonal steel bar, five feet long. Two three-quarter inch octagonal steel bars, 4½ to 5 feet long. One five-eighth inch octagonal steel bar, four feet long, for tapping, when necessary. All these bars must have diamond points and large heads. It is well also to have a number of "claws" made of Norway iron, to assist in withdrawing the bars if any of them should become stuck inside the furnace. One ten-pound double-faced striking hammer, No. 52. One four and one half-pound double-faced hand drilling hammer. Two three-eighth inch rods of iron, six to seven feet long. One three-fourth inch rod of iron, 12 feet long. One three-fourth inch rod of iron, eight feet long. One tuyere poker, three-fourth inch round iron, 4½ feet long. Two scrapers, one-fourth by two inches flat iron, 20 inches long. One tamping-iron, having a face of two inches by one-half an inch, and one inch in thickness, and a handle 18 inches long. Three tamping-rods for plugging up slag-hole, about eight feet long, with buttons on one end about two inches in diameter. Ten bullion molds, each holding 100 pounds of metal. One trimming chisel, five-eighth inch octagonal steel, with a face of 1½ inches. One skimmer for skimming the bullion in the cooler, provided such be used. One small skimmer for cleaning the surface of the metal in the antimonio tap. One bullet ladle for taking slag samples. A number of bullion ladles made of one-fourth or three-sixteenth inch charcoal iron, 8½ inches in diameter and 3½ inches in depth, to which is attached a gas-pipe handle two feet ten inches in length, turned so as to form a proper hand grip. The handle must be securely riveted to the bowl. In blowing out the furnace there will be required two long bars, 1½-inch octagonal steel, 12 feet in length. Sundry shorter bars, drill pointed. Two rabbles, 7½ inch by 6 inch face, securely riveted to eight-foot handles with a proper hand grip. Two goat-foot hooks for withdrawing lumps or accretions. Two perforated ladles, 14 inch by 12 inch face, with eight-foot handles of seven-eighth inch diameter, and proper hand grip, to clean out the metal in the crucible. Lamps and lanterns. For the base bullion sampler there is required: One punch of seven-eighth inch octagonal steel. One cold chisel. One set three-fourth inch figures.

The Bruckner Roasting Cylinder.

We illustrate on page 135 the most approved form of the Bruckner roasting cylinder. These furnaces are made from 6 feet to 8½ feet in diameter and from 12½ to 18½ feet long, and are lined throughout with fire-brick. The shells are of heavy boiler-plate, to which are attached two heavy chilled iron and steel rings, each of these resting upon two chilled iron rollers, upon which the cylinder is supported and revolves. Motion is given to the cylinder by means of spur and bevel gears.

Ore is introduced into the cylinder through two charging doors, which come directly under the gates in the charging hopper placed over the furnace. This hopper is of iron, supported by cast-iron columns, and holds sufficient ore to charge the cylinder. The roasting of the ore is effected in this furnace in lots of several tons, and when thoroughly roasted and chlorodized is discharged into hoppers beneath cylinder, from which it can be drawn into cars as wanted.

Sometimes a different arrangement is made, by which the roasted ore is discharged directly into cars passing under center of furnace. At one end of the cylinder fire is made in an iron fire-box lined with fire-brick, and having an opening in the end to match that in cylinder, and through which the flame passes.

The fire-box, as will be seen in cut, is mounted on wheels running upon a track at right angles to the axis of the cylinder, thus admitting of its being moved to one side when the furnace is not in use, and affording ready access to the interior of the cylinder for repairs or other purposes. As the furnace revolves, the ore is thoroughly mixed and exposed to the flame and heat, and roasting is effected. The time occupied in roasting can be varied at pleasure, so that very base ores can be thoroughly treated. In this respect the Bruckner furnace possesses an advantage over most mechanical furnaces, for in them the time the ore remains in the cylinder and exposed to the flame is necessarily limited.

The Union Iron Works of this city have made a large number of these furnaces, 12 of the No. 3 below having been furnished by these works to the Anaconda reduction works, Montana. They were of the same general style shown in the cut. Others have been furnished to the Compania del Progresso, Mexico, and the Belmont mine, Nevada.

Death of Rev. Dr. McKaig.

Rev. Walter Wilber McKaig, well known throughout this State as preacher, orator and writer, died last Sunday in Oakland, aged 63. He had been for years afflicted with diabetes, and his death was the close of a tedious, often painful illness, the last three months of which he was kindly cared for at the Fabiola hospital.

Dr. McKaig was a native of Ohio, the son of a Scotch farmer. He studied for the ministry and began preaching as a Methodist, but afterward joined the Presbyterians. He had charge of churches in Cincinnati and Chicago, and when David Swing was accused of heresy, Dr. McKaig warmly espoused his cause, and was afterward tried himself, on similar charges, but acquitted.

Coming to California about 1868, Dr. McKaig first ministered to a large and thriving Presbyterian Society at Marysville, but having become a convert to liberal views, he moved to San Jose, where he preached for some time to the Unitarian Society.

Afterward, having studied law, he was admitted to the bar and practiced awhile in Colusa, having ex-Attorney-General Hart for his partner. But he was heard to say that although he could earn more as a lawyer than as a preacher, he always regretted having left the ministry. And in truth he never gave up preaching altogether, but often filled the pupils of the late Rev. L. Hamilton in Oakland and of Dr. Stebbins in San Francisco, besides delivering addresses to various Spiritualist associations.

In later years he edited the Stockton *Independent*, and was engaged successively in editorial work on the Oakland *Tribune*, *Enquirer* and *Evening Express*. He also tried law and journalism in Los Angeles. His latest work was done for the *Illustrated Pacific States* and the *Rural Press*, and the many articles which he wrote for our columns, from 1883 to within a few months of his decease, were marked by a philosophic insight, a humane spirit, a wise breadth of treatment and a combined strength of thought and felicity of diction which made them at once pleasing and impressive. His editorials for holidays and anniversaries, and on questions of wide bearing and large public import, were especially happy and suggestive.

Dr. McKaig was a member of the Knights Templar and Enterprise Lodge, A. O. U. W., at San Jose. He leaves two sons and a married daughter, the latter residing in Chicago.

The funeral services took place at Hamilton hall, in Oakland, Tuesday morning. Rev. C. W. Wendte of the Unitarian church and Rabbi M. S. Levy spoke eloquently of the departed, and James G. Clark sang feelingly certain stanzas written by himself.—*Pacific Rural Press.*

THE STANFORD UNIVERSITY.—It was announced some time ago that work on the Stanford University buildings at Palo Alto had been suspended. The report, however, seems to be unfounded, as the work is now being pushed forward as rapidly as possible. The six school-buildings are completed save for the interior decorations. It is believed that the University will be finished in time to begin the scholastic term in September, 1891.

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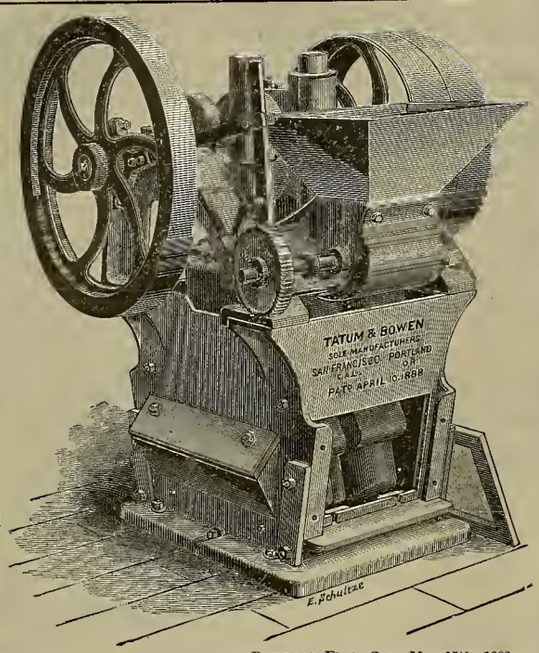

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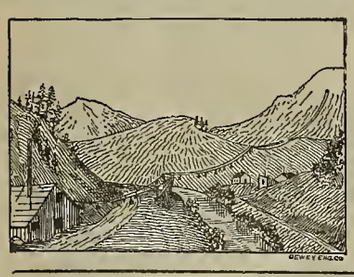

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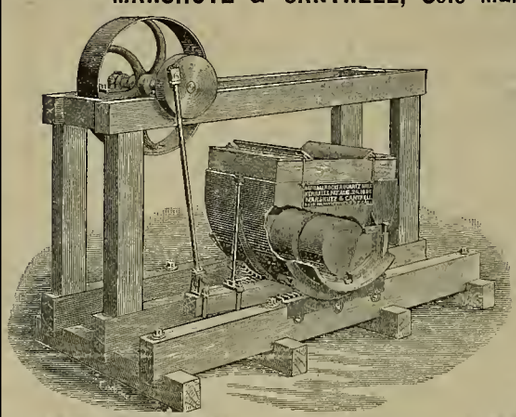

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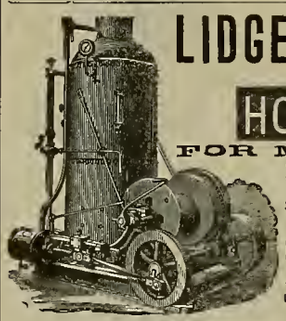

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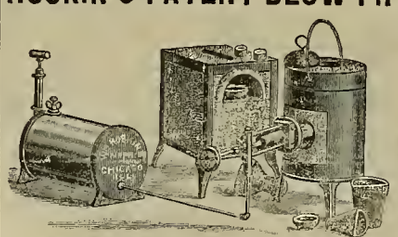

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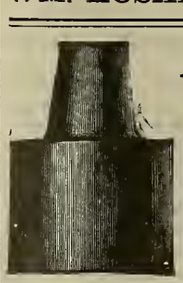

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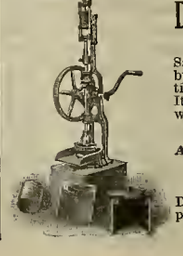

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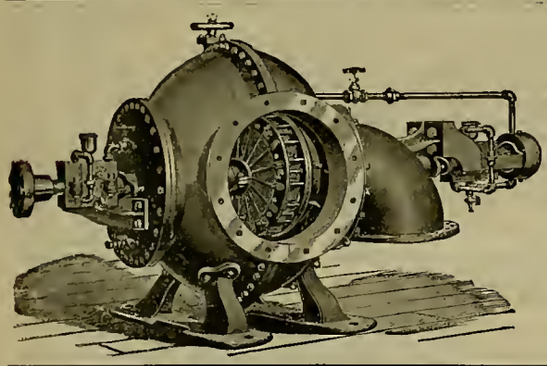

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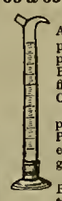

We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

M.C.C° BATTERSEA

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents for the Morgan Crucible Co., Battersea, England. Also for E. G. Dennistoun's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.

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BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.

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221 & 223 First St., San Francisco, Cal.

JOHN W. QUICK, Proprietor.

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Free Coach to the House.

J. POOLEY.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Aug. 28, 1890.

General trade continues fairly active. The high price of farm products continues to inspire confidence in the future. Immigration is beginning to set this way, causing small farms to be in better demand.

The money market is easy, notwithstanding an enlarged demand for funds for moving the crop.

MEXICAN DOLLARS—The market is strong at full figures. The demand is not so active. Quotations are given at 92@92½ cts.

SILVER—The feeling is hullish. Considerable is being held for sale in next month. Offers are made direct to the Department at Washington, and consequently counter-rates are misleading, being fully one cent below Mint prices for large parcels. Washington advices report the following purchases: Aug. 22: 100,000 ounces at 119.3, 100,000 ounces at 119.4, and 150,000 at 119.5. The total offerings were 1,520,009 ounces. Aug. 25: The amount of silver offered was 100,000,000 ounces. The amount purchased was 200,000 ounces at $1.195, 100,000 ounces, $1.1974, and 150,000 ounces at $1.1975. Aug. 27: The amount offered was 1,911,000 ounces, and the amount purchased was as follows: 138,000 ounces at $1.19, 115,000 ounces at $1.19⅝, and 325,000 ounces at $1.19¼ per ounce. London cables received to-day report an advance of ⅜d. Eastern mail advices report that the Secretary of Treasury will buy all the silver offering at reasonable figures irrespective of the monthly quota. It is an open secret that the Secretary will do all he can to force silver to par. The country needs the money and his course meets with commendation.

QUICKSILVER—The market is irregular at quotations, owing to free imports by rail. Receipts the past week aggregate as follows: 208 flasks, and by overland railroad 300 flasks; total, 508 flasks. Exports the past week aggregate 446 flasks to Mexico and 10 flasks to New Zealand.

LIME—Receipts the past week aggregate 4724 bhls., and exports by sea 200 bhls. to Honolulu. The market is steady.

BORAX—Receipts the past week aggregate 7271 centals. The market is fairly steady.

LEAD—The market is strong at full prices. We make several advances in quotations.

TIN—The market is stiff for both plate and pig in sympathy with better prices abroad. English cables report an active demand for plate at improved prices. The Amman furnaces at Swansea have been restarted. The advance in silver is in favor of holders.

COPPER—The market is very strong at full quotations. The Lake companies appear disposed to keep prices at about 17 cts. London cable to the *Iron Age* reports as follows: Copper is much stronger. The rise is attributed chiefly to covering of short sales on which deliveries are due next month, and purchases of three months' futures by the combination which now holds the bulk of the stock here, and appears determined to maintain prices. The public are not buying at present prices and consumers are waiting. Stocks have decreased heavily during the past fortnight, owing to small arrivals from America.

IRON—The market is strong, with a good consumption reported. The East reports a more active market. From England, cablegrams report a strong market at a slight advance.

COAL—Imports the past week aggregate as follows: Seattle, 4220 tons; Coos Bay, 450; Departure Bay, 849; total, 5519 tons. The market is very strong, with the tendency upward for all kinds. A reported fire in the Wellington mine and a general strike by laborers in Australia are important factors in producing a higher market. The feeling is decidedly hullish, which will result in much higher prices unless the strike is declared off, or else non-union men are secured to go to work at an early day. At this writing, fuller information is awaited with impatience. The coast coals will increase their output, but even this with a scarcity or a shut-off from Australia will not meet our requirements in the near future.

San Francisco Metal Market.

	WHOLESALE. THURSDAY, August 28, 1890.
ANTIMONY	22½@ —
BORAX—Refined, in carload lots	8 @ —
Powdered " "	8 @ —
Concentrated " " "	7½@ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheathing	23 @ 25
Ingot, jobbing	24 @ —
do, wholesale	18 @ 18½
Fire Box Sheets	23 @ 25
LEAD—Pig	— @ 5¾
Bar	5¾ @ —
Sheet	7¼ @ —
Pipe	8½@ —
Shot, discount 10% on 500 bags Drop, ⅌ bag.	1 85 @ —
Buck, ⅌ bag	1 85 @ —
Chilled, do	2 05 @ —
QUICKSILVER—By the flask	56 00 @ —
Flasks, new	— @ —
Flasks, old	4 @ 55
TINPLATE—B. V., steel grade, 14x20, to arrive,	— @ —
B. V., steel grade, 14x20, spot	— @ 4 80
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	6 00 @ —
do, do, 20x28	12 00 @ —
Pig tin, spot, ⅌ lb	23 @ —
CHROME IRON ORE, ⅌ ton	10 00 @ —
IRON—Bar, base	3 @ 3½
Norway, base	4½@ 5½
STEEL—English, lb	16 @ 20
Cantou tool	9 @ 9
Black Diamond tool	8 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
	Spot. To Load.
IRON—Glengarnock ton	34 00 @— — 30 @ —
Eglinton, ton	34 00 @— — 30 @ —
American Soft, No. 1, ton	— @32 00 30 @ —
Oregon Pig, ton	— @33 00 — @ —
Puget Sound	34 00 @— — — @ —
Clay Lane White	— @28 00 26 @ —
Bbotts, No. 1	34 00 @35 00 32½@ —
Langloan	34 00 @— — 30 @ —
Thorneliffe	34 00 @— — 30 @ —
Gartsberrie	34 00 @— — 30 @ —
Barrow	34 00 @— — 30 @ —
Thomas	33 00 @— — — @ —
Cargofleet	30 00 @— — 26 @ —

THE ore and bullion receipts by the various Salt Lake City banks for the week ended August 23 were $231,259, as compared with $240,029 for the week previous.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Almont M Co	Arizona	2	½	July 12	Aug 13	Aug 30	S Harman 302 Montgomery St
Best & Belcher M Co	Nevada	47	25	Aug 21	Sept 25	Oct 17	L Osborn 309 Montgomery St
Bona Fors M Co	California	1	5	June 19	Aug 19	Sept 5	E K Taylor 12 Montgomery St
Cons Imperial M Co	Nevada	28	5	July 17	Aug 20	Sept 11	C L McCoy 325 Pine St
Exchequer M Co	Nevada	29	25	July 10	Aug 14	Sept 4	C E Elliott 309 Montgomery St
Gover M Co	California	2	25	July 15	Aug 20	Sept 6	Gray Dew 13 and 15 Fremont St
Gray Eagle M Co	California	19	6	Aug 25	Sept 29	Oct 20	J M Buttington 303 California St
Guascaran & California M Co	Honduras	2	10	Aug 12	Sept 20	Oct 8	E Oliver 22 Montgomery Ave
Humboldt M & M Co	Nevada	1	1	Aug 16	Sept 23	Oct 25	J C Ruddock 35 New Montgomery St
Keutuck M Co	Nevada	22	30	Aug 18	Sept 22	Oct 14	J W Pew 310 Pine St
Locomotive M Co	Arizona	8	5	Aug 13	Sept 18	Oct 6	A H Fish 309 Montgomery St
Mayflower Gravel M Co	California	48	20	Aug 5	Sept 6	Sept 29	J Morzio 328 Montgomery St
North Bonanza M Co	Nevada	10	10	July 10	Aug 18	Sept 2	M L Templeton 533 Kearny St
Occidental Cons M Co	Nevada	7	28	Aug 5	Sept 11	Oct 7	A K Durbrow 309 Montgomery St
Peer M Co	Arizona	9	10	Aug 7	Sept 12	Oct 3	N T Messer 309 Montgomery St
Peerless M Co	Arizona	15	15	Aug 14	Sept 23	Oct 14	A Waterman 309 Montgomery St
Phi Sheridan M Co	Nevada	5	10	July 10	Aug 20	Sept 4	M L Templeton 533 Kearny St
Teresa M Co	Mexico	2	5	Aug 13	Sept 18	Oct 8	A Chemmant 328 Montgomery St
True Cons M Co	California	9	2½	May 26	July 21	Sept 15	J C Bates 434 California St
Union Coos M Co	Nevada	41	26	July 21	Aug 26	Sept 15	A W Barrows 303 California St
Utah Cons M Co	Nevada	10	25	Aug 5	Sept 15	Oct 2	A H Fish 309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Con Golden Gate Sulphuret M Co	Cal.	F B Oliver	320 Sansome St	Annual	Sept 11
Grand Prize M Co	Nevada	R R Grayson	327 Pine St.	Annual	Sept 16

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	July 15
Con California & Va M Co	Nevada	W Havens	309 Montgomery St	25	Jun 16
Eclipse Gravel M Co	California	P Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Busb	306 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Aug 11

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 7.		WEEK ENDING Aug. 14.		WEEK ENDING Aug. 21.		WEEK ENDING Aug. 28.	
Alpha	1.20	1.30	1.00	1.20	1.10	1.20	1.15	1.30
Alta	1.20	1.25	.95	1.05	1.05	1.15	1.05	1.20
Andes	.65	....	.50	.65	.50	.75	.70	1.25
Belcher	3.10	3.45	2.70	3.15	2.80	3.10	3.05	3.30
Best & Belcher	3.05	3.55	2.75	3.10	2.85	3.15	3.15	3.50
Bullion	3.05	3.55	2.20	3.10	2.20	2.70	2.50	3.05
Bodie Con	1.20	1.30	.90	1.15	.95	1.30	1.25	1.55
Bulwer	.25	....	....	....	.20	.25	.25	.30
Commonwealth	3.00	3.45	2.95	3.05	2.50	2.70	2.55	3.05
Con. Va. & Cal	3.75	4.00	3.50	3.80	3.55	4.10	4.05	5.00
Challenge	2.35	2.60	1.90	2.25	2.05	2.20	2.20	2.40
Chollar	2.80	3.40	2.40	2.70	2.45	2.70	2.70	3.45
Confidence	6.00	6.12	5.00	5.75	5.00	....	5.00	5.50
Con. Imperial	.35	....	.30	.35	.30	.40	.40	....
Caledonia	.40	....	.25	.40	.30	....	.35	.45
Crown Point	2.70	2.95	2.20	2.75	2.40	2.60	2.65	2.85
Crocker	.25	....	.25	....	.20	....	.15	.25
Del Monte	1.40	....	1.00	1.35	....	....	1.20	....
Eureka Con	4.15	....	3.95	4.25	4.00	4.25	4.50	4.90
Exchequer	.65	.85	.50	.80	.75	.95	.85	.95
Grand Prize	.25	.45	.25	.30	.30	....	.25	.35
Gould & Curry	2.05	2.60	1.75	2.15	1.85	2.30	2.25	2.45
Hale & Norcross	3.55	2.75	2.05	2.60	2.15	2.60	2.45	2.80
Julia	.25	....	.15	.20	.20	.25	.25	.30
Justice	1.40	1.45	1.20	1.40	1.30	1.35	1.35	1.40
Kentuck	1.20	1.30	.85	1.05	.90	1.05	.90	1.10
Lady Wash	.35	.50	.30	.35	.33	.37	.30	.40
Mono	.50	.70	.35	.40	.40	.60	.60	.70
Mexican	3.15	3.45	2.85	3.15	2.85	3.20	3.10	3.45
Navajo	.50	....	....	....	....	....	....	....
North Belle Isle	1.15	....	1.00	....	1.05	....	1.10	....
Nev. Queen	.75	.80	.60	.70	....	....	.75	1.40
Occidental	.80	1.15	.75	.90	.80	.90	.90	.95
Ophir	4.75	5.50	4.35	4.95	4.50	4.70	4.65	5.25
Overman	2.00	2.40	1.35	2.05	1.90	2.20	2.10	2.25
Potosi	6.12	7.12	5.25	6.62	5.50	6.50	6.12	7.37
Peerless	.20	....	.15	.20	.10	.15	.10	....
Peer	....	....	.10	....	.10	....	.10	.20
Savage	3.30	3.95	3.10	3.50	3.40	4.30	3.85	4.20
S. B. & M	1.40	1.70	1.05	1.25	1.20	1.30	1.25	1.50
Sierra Nevada	2.85	3.15	2.40	2.75	2.55	2.75	2.65	3.15
Silver Hill	.25	.30	.20	.25	.25	.30	.25	.30
Scorpion	.20	....	.15	.20	....	.20	.20	.25
Union Con	2.45	2.85	2.25	2.60	2.35	2.50	2.85	3.10
Utah	.65	.90	.55	.65	.60	.65	.65	.80
Yellow Jacket	3.25	3.40	2.80	3.30	3.00	3.20	3.15	3.50

Eastern Metal Markets.

By Telegraph.

NEW YORK, August 27.—The following are the closing prices the past week:

	Silver In London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	53½	1 18¾	$16 80	$4 62½	$21 40
Friday	53½	1 18	16 80	4 62½	21 40
Saturday	53½	....	16 80	4 62½	21 40
Monday	53½	1 19	16 80	4 65	21 80
Tuesday	53¾	1 18½	16 80	4 70	21 80
Wednesday	53¾	1 18½	16 85	4 70	21 80

NEW YORK, August 26.—Quicksilver steady, 73@76c. Borax, more offering, 9@9¼c; California refined and powdered sell at full prices. Some best Lake Copper, filling orders, $17; Arizona, $15.25@15.50; casting, $14 25@14.50. Pig Lead stronger; offering moderate; $4.67½@4.72½ for September.

Coal.

TO LOAD.	Per Ton.	SPOT FROM YARD.	Per Ton.
Australian	$ 8 00@$8 50	Wellington	$ 8 9 00
Liverpool St'm.	$ 00@ $ 25	Greta	9 00 @10 00
Scotch Splint	$ 25@ $ 50	Westminster Brymbo	9 00
Cardiff	$ 50@ —	Nanaimo	9 00
Lehigh Lump	16 50@17 00	Sydney	9 50 @10 00
Cumberland bk	13 50@ —	Oilman	9 50
Egg, hard	15 00@ —	Seattle	9 50
CANADIAN ANTHRACITE COAL		Coos Bay	6 00
Egg, ship side	$12 50	Cannel	12 00
Egg, yard	15 00	Egg, hard	16 00
Stove, yard	15 00	Cumberland, in sacks	16 00
Nut, yard	15 00	do. bulk	15 00
		Wallsend	9 00@ 9 50

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Wodoc and Lassen Cos.
T. M. STACKUS—Sierra Co.
J. W. PURDY—Sonora, Cal.
GEO. WILSON—Sacramento Co.
FRANK S. CHAPIN—Colusa Co.
J. C. HOAG—San Francisco.
SAMUEL CLIFF—San Luis Obispo Co.
W. W. THEOBALDS—Orange and San Diego Cos.
C. J. WADE—San Bernardino Co.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
E. B. TAFT—Clements, Cal.
E. H. SCHAEFFLE—Calaveras Co.
O. N. CADWELL, Carpinteria, Cal.
WM. M. HILLBARY—Oregon.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.
E. E. DEMING—Ashland, Oregon.
Hal. CASS BROWN—Oregon and Washington.
R. O. BAILEY—Washington.
A. S. ROBERTS—The Dalles, Oregon.
T. B. LESIEUR—Humboldt Co.
J. P. QUINETTE—San Francisco.

Mining Share Market.

On Friday and Saturday last the Comstocks were active and at higher prices, but on Monday and part of Tuesday the market was slow at shaded prices. Tuesday afternoon prices began to advance under Ophir's leadership, which was followed by higher prices for all stocks on yesterday (Wednesday) morning. In the afternoon, prices were barely steady at lower quotations. There is every indication that insiders are still buying, being forced to do so owing to many outsiders selling so as to buy back for less money—the points being out for lower prices and also that there will not be anything in the market except little ups and downs before the middle of next month (September). In order to help the hears, reliable news from the mines is kept back, delay made in starting the pumps and everything else done to encourage selling.

In outside stocks Bodie has been active on a report of a strike on the 700-foot level. Our advices do not report a strike, but they state that the ground is very fertile and that there is every encouragement for finding a rich pocket for which the mine is noted. In the Quijotoas, Central has been more active, a block of 1000 shares changing hands at an advance, with more bid for at the same price. The Tuscaroras are showing more life at advancing prices. The advance in silver is used as a hull argument in their favor. Eureka is also more active at higher prices.

The high and advancing prices of silver is an incentive for more active prospecting in the Comstock mines. It is not at all unlikely hut more men will be put to work in several of the mines at an early day.

The Kentuck Mining Co. receives a weekly letter from the superintendent of the mine, giving full detailed iuformation of the work being done, and also the daily ore assays. Evidently the company, hy the suit against Gov. Stevenson, has learned that it is rather expensive not to obey the law. More lawsuits will have to he brought to teach other companies that they are not above the law.

The *Report* of this city is authority for the statement that Commodore Flood says that Col. Mackay and he control the Con. California and Virginia mine. If this be correct, why do not the two gentlemen have the mine run according to law—give the mine assays, etc., and have everything else done to disarm criticism? There are many aside from Col. Mackay and Commodore Flood who own stock.

The Andes Mining Co. has four miners, an increase of two since last March, at work, which probahly accounts for the advance in the stock. Assessments must be collected and the several officers paid good salaries for the arduous work they have to perform.

Private advices from the Comstock mines are hard to get, owing to insiders trying to stop all leaks. Our correspondent writes that there is a good deal of secret work going on in several of the mines which is of an important character. Official letters received yesterday report active prospecting in Hale and Norcross, but this is offset hy the battery assays going down to $13 a ton. In Savage, further improvements are reported. Crown Point's and Belcher's battery assays are higher, the former about $3 a ton more. In Belcher, Seg. Belcher, Challenge, Confidence and Overman, active and promising prospecting work is under way. The superintendent of the Kentuck Mining Co. reports officially as follows: "I am trying to discover something new on the 1000-foot level. The indications for success are very good. If I am fortunate enough to succeed, it will create a big rumpus, for it would be 100 feet west of the west ledge. The ground improves as we go west, as can be seen hy the assays sent to you." At the office in this city these assays show a steady increase from a few cents a ton to over $2 a ton, with nearly all gold. From Con. Virginia confirmatory information is received of the improvement noted hy us fully three weeks ago. In Ophir, connection between the 1300 and 1465 levels will he made within a few days, when active and important prospecting will be inaugurated. A north drift has been started from the Potosi winze to tap an ore hody in Chollar. From Sierra Nevada, Union, Best and Belcher, the news is of an encouraging character.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Sales at San Francisco Stock Exchange.

THURSDAY, Aug. 28, 9:30 A.M.:

50	Alpha Con	1.20	
3730	Andes	1.15@1.40	
100	Belcher	3.15	
100	Best & Belcher	3.30	
100	Bodie	1.45	
300	Bullion	2.70@2 75	
125	Challenge Con	2.30	
10	Chollar	3.15	
200	Commonwealth	3.05	
320	Con. Cal. & Va	4.60@4.70	
1050	Con. New York	40c	
150	Con. Imperial	40c	
100	Crown Point	2.75	
100	Dudley	10c	
250	Exchequer	95c	
200	Gould & Curry	2.30	
150	Hale & Norcross	2.70	
300	Hendricks	40c	
100	Iowa	40c	
100	Julia	25c	
100	Lady Washington	40c	
200	Mexican	3.25@3.30	
50	Occidental	9 c	
150	Ophir	5.00	
550	Overman	2.25	
100	Potosi	6.50@6.62½	
600	Savage	4.00@4.10	
30	Sierra Nevada	2.90	
650	Silver Hill	30c	
125	Union Con	2.90	
50	Utah	75c	
150	West Comstock	65c	
100	Yellow Jacket	3.30	

Assessment Notices.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of August, 1890, an assessment, No. 19, of six (6) cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 11, No. 303 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of September, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 20th day of October, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California Street, San Francisco, California.

DELINQUENT NOTICE.

GOVER MINING COMPANY—LOCATION of principal place of business, City and County of San Francisco, California; location of works, near Drytown, Amador county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 2) levied on the 14th day of July, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Wheeler, W A	53	1,100	275 00
Pratt, Freeman	95	50	12 50
Small, John C	96	1 066	266 50
Trefethen, George	99	500	125 00
Sanborn, Helen P	101	250	62 50
Dyer, S C	102	200	50 00
Parsons, C A	103	200	50 00
Stone, N I	142	3,000	750 00
" "	155	2,000	500 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of July, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Nos. 13 and 15 Fremont street, San Francisco, California, on SATURDAY, the 6th day of September, 1890, at the hour of one o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

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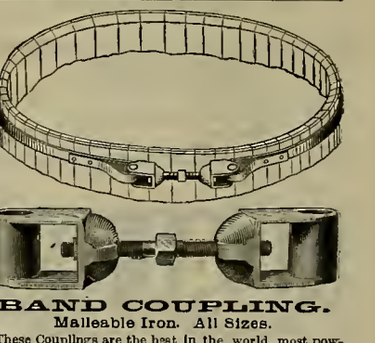

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San Francisco, Cal.
ANDREW S. GRANT,
San Francisco, Cal.

STATE OF CALIFORNIA, } ss.
City and County of San Francisco, }

On this 12th day of July, in the year one thousand eight hundred and ninety, before me, Geo. T. Knox, a Notary Public in and for the City and County of San Francisco, personally appeared Samuel B. Connor, of said City and County and State, and Andrew S. Grant of the same place, each personally known to me to be the persons whose names are subscribed to, and who executed the within instrument, and they acknowledge to me that they executed the same.

In witness whereof, I have hereunto set my hand, and affixed my Official Seal, at my office, in the City and County of San Francisco, the day and year in this certificate first above written.

[NOTARIAL SEAL.] GEO. T. KNOX, Notary Public.

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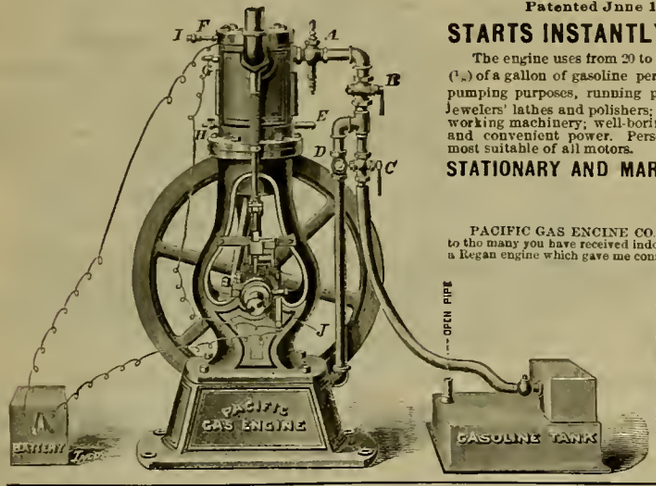

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The change from the Regan to the Pacific is a decided improvement. I can also get a third more power since the change, and I cheerfully recommend your engine as being simple, effective and cheap.

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B. S. HILL.
Cor. Eocinal Ave. and Morton St.

U. S. MARINE HOSPITAL SERVICE, DISTRICT OF THE PACIFIC,
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TO THE PACIFIC GAS ENGINE CO.—GENTLEMEN: In answer to your letter of inquiry, of the 23d ultimo, relative to the working of the two-horse power vapor gas engine, recently set up by you at the U. S. Marine Hospital, Mountain Lake, near the City of San Francisco, Cal., I have to say that, up to date, the engine has given entire satisfaction, developing the power required in the specifications; of "raising 20,000 to 30,000 gallons of water 100 feet high through 600 feet of two-inch iron pipe, to tanks on the hill, in 24 hours." It is more economical than steam, requires less attention, and can be set in operation at a moment's notice.

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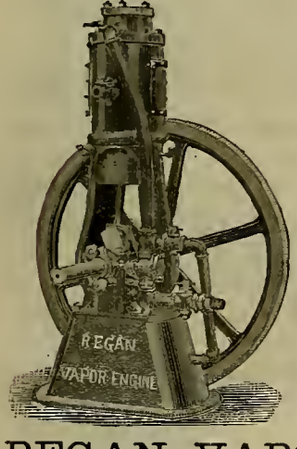

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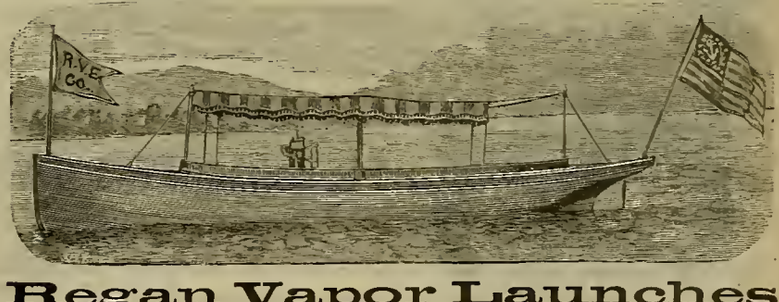
Yours truly, GEO. HAAS.



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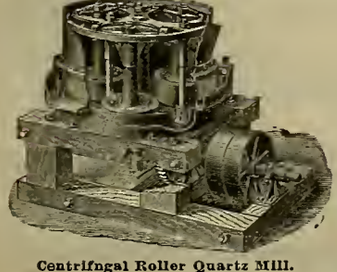

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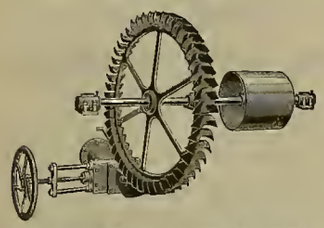

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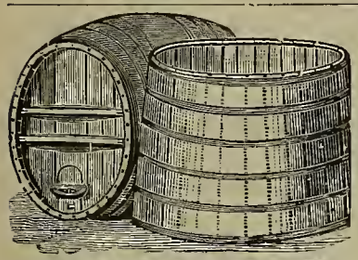

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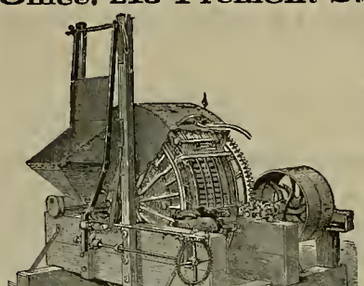

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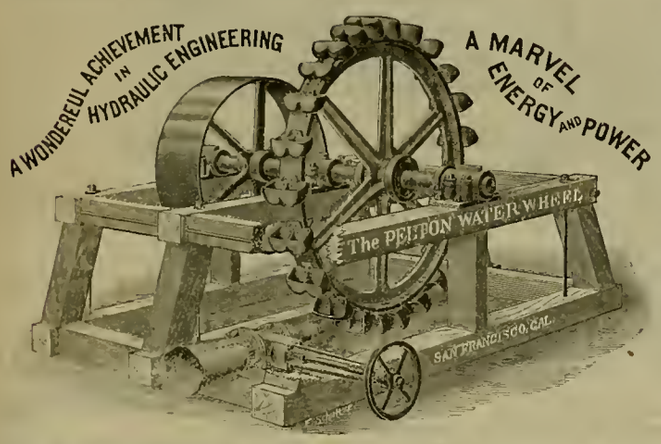
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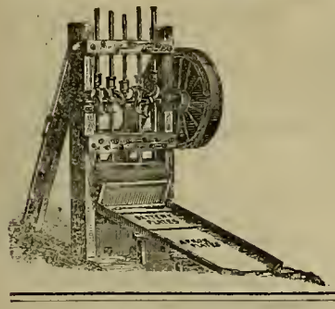

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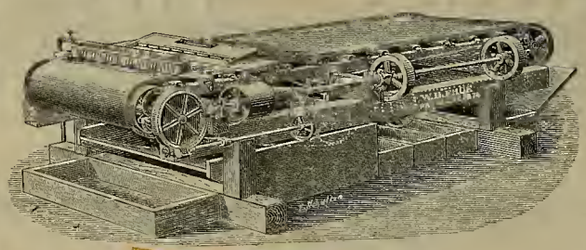

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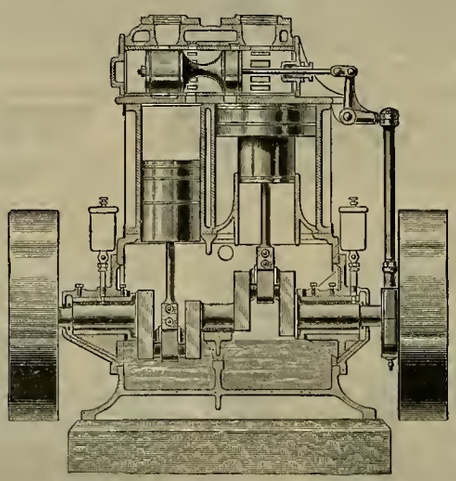

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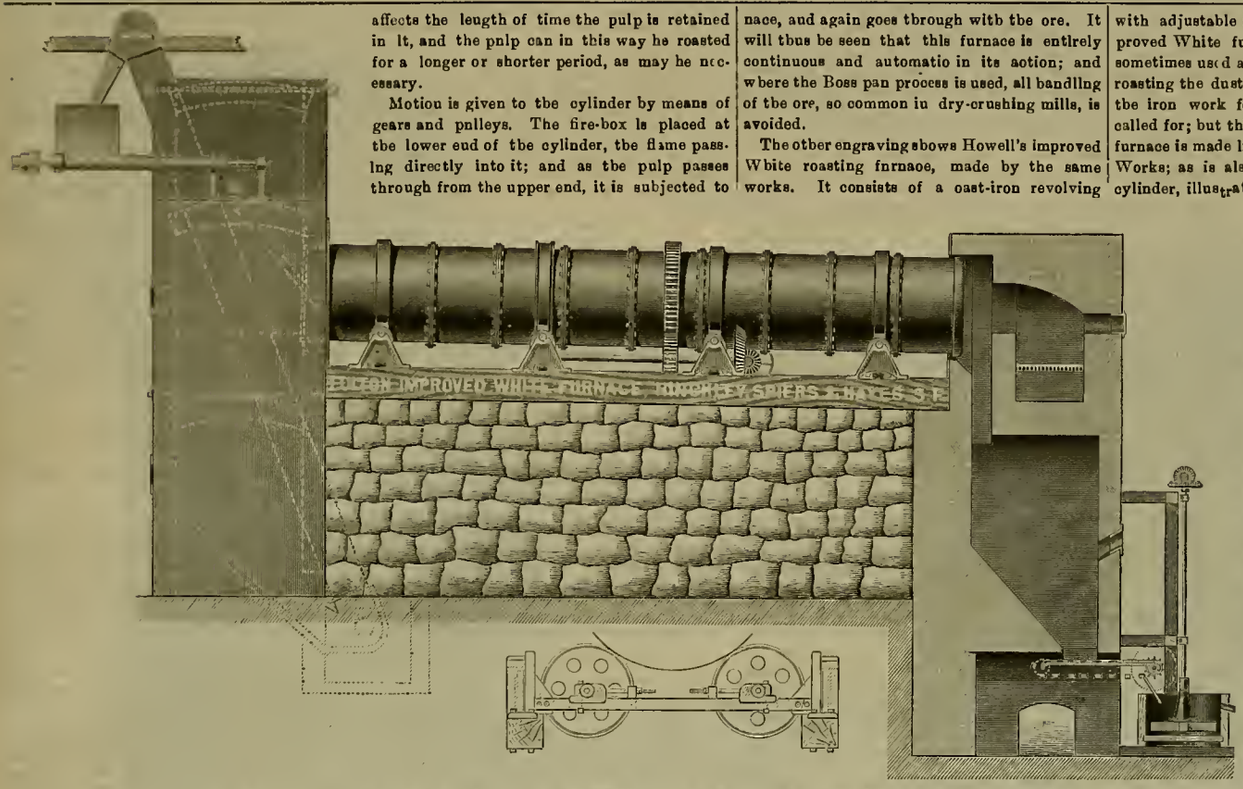


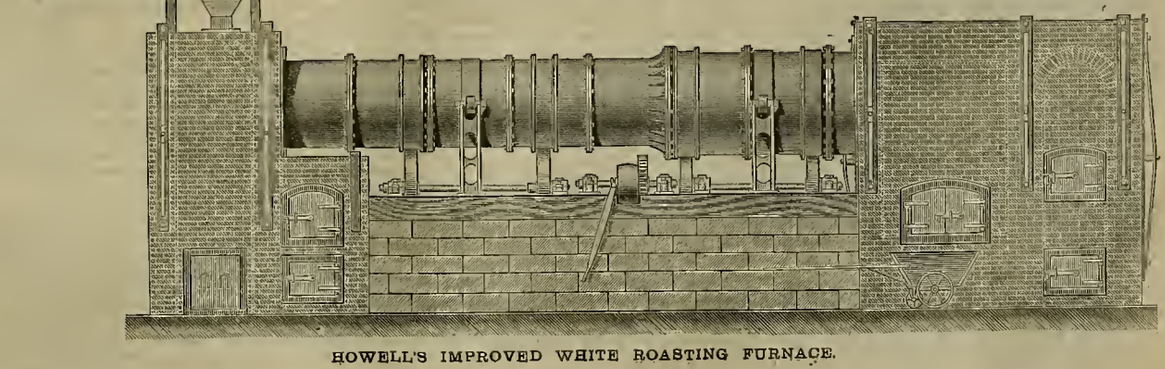
FULTON IMPROVED WHITE ROASTING FURNACE, WITH AUTOMATIC DISCHARGE AND MIXER.

Ore-Roasting Furnaces.

On this page is shown the well-known White roasting furnace with improvements made by the Fulton Iron Works of this city, which greatly facilitate the handling and adjusting of the cylinder, and also for discharging the roasted ore from the bin. The ore upon coming from the batteries is elevated into the hopper, shown above the furnace, and is from there taken by a conveyor and fed into the upper end of the cylinder. The amount of salt needed for proper chlorination is added before the pulp enters the cylinder. This furnace is entirely mechanical and continuous in its action, and consists of a long cast-iron cylinder, made in sections to facilitate handling and transportation, and is lined at the mill with firebrick throughout its entire length. Several courses of these brick project beyond the others, so that in passing through the pulp is raised by the turning of the cylinder and showered through the flame. As will be seen, the roasting cylinder has a slight inclination, and is supported by and revolves upon four sets of rollers. The distance at which these rollers are set apart determines the inclination of cylinder, and consequently the inclination can be varied at pleasure, as will be seen in Fig. 2. As the frames carrying the rollers are supported in trunnion bearings, they at once adjust themselves to the angle of the cylinder. This change in the inclination of the cylinder of course directly affects the length of time the pulp is retained in it, and the pulp can in this way be roasted for a longer or shorter period, as may be necessary.

Motion is given to the cylinder by means of gears and pulleys. The fire-box is placed at the lower end of the cylinder, the flame passing directly into it; and as the pulp passes through from the upper end, it is subjected to a gradual increase in the intensity of the heat until it is discharged into the bin under the fire-box. At the bottom of the bin the pulp passes through an opening on to a cast-iron table, over which heavy iron scrapers slowly move, discharging the ore into a mixer or tank, into which stirrers thoroughly mix it with water, which is here introduced, and is then led to pans in a pipe or sluice. The speed with which the scrapers move across the face of the table can be adjusted to suit the discharge from furnace. The dust carried out of upper end of cylinder is collected in dust-chambers having their sides inclined to the foot of an elevator, by which it is carried up to hopper above furnace, and again goes through with the ore. It will thus be seen that this furnace is entirely continuous and automatic in its action; and where the Boss pan process is used, all handling of the ore, so common in dry-crushing mills, is avoided.

The other engraving shows Howell's improved White roasting furnace, made by the same works. It consists of a cast-iron revolving cylinder, differing principally from the White furnace just described in having only that portion of the cylinder nearest the fire lined with fire-brick, the balance being exposed, as the heat is not so great at the upper end. The cylinder is of the same internal diameter throughout, the difference in the external diameter being due to the fire end being lined with brick. Projecting shelves are arranged on the sides for showering the pulp through the flame, as in the White furnace. The cylinder, as shown in the accompanying engraving, is supported upon four rollers or wheels, and is revolved by the friction between it and the wheels, the latter being driven by means of gears and pulleys. It is kept in its central position on the top of the wheels by means of guide rollers acting against its sides. The angle of cylinder as illustrated cannot be changed; but, when desired, these furnaces are furnished with adjustable rollers, etc., as with the improved White furnace. An auxiliary fire is sometimes used at upper end of cylinder for roasting the dust which is carried through, and the iron work for which is furnished when called for; but this is now seldom used. This furnace is made in this city by the Fulton Iron Works; as is also the Bruckner ore-roasting cylinder, illustrated last week, and erroneously referred to as made by another local foundry.



HOWELL'S IMPROVED WHITE ROASTING FURNACE.

The Silver Situation.

There is considerable dissatisfaction felt regarding the course of the Secretary of the Treasury in allowing the Mint-counter rate to be a fixed price and from three-quarters of a cent to over one cent an ounce below the prices paid by the Department at Washington under direct selling offers. This discrimination, it is claimed, is not only in direct contravention to the spirit of the law now in force, but it helps speculators to the injury of small producers. This latter assertion is evidenced by the fact that local buyers in this city pay for small lots from a quarter to one-half of a cent an ounce above the Mint-counter rate, and sell to the Department in round lots at an advance paid by them, thus netting a good profit. The purchases of the Department since August 13th aggregate a little over 4,250,000 ounces, or within 250,000 ounces of the quantity required by law for the monthly purchases. The buying of this quantity has sent the price up in this country, and also in Europe, to higher figures than have obtained for fully eight years. If this buying has done so much, free coinage would soon bring it to par.

So far, the theories of monometallists against the white metal are exploded, and with such favorable results as our Eastern exchanges show have so far resulted from the advance in the price of silver, himetallism has made many proselytes, and it is quite safe to affirm that the next Congress will pass a free-coinage bill.

CINNABAR ORE has been discovered on Quicksilver mountain, the southern continuation of War Eagle mountain, Idaho.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

The Colorado Desert.

[Written for the PRESS by C. R. ORCUTT, San Diego.]

The broad alluvial plains lying west of the Colorado river, in San Diego county, California, are generally known under the name of the Colorado Desert. These plains and the contiguous barren hills and mesas have as yet been scarcely explored by man, and only small portions of this region have yet been in any way carefully examined.

Nearly one-half of this arid section of the West lies within the Mexican Territory of Lower California. Altogether it probably exceeds 12,000,000 acres in extent. In all probability no portion of the arid lands of the United States is as little known, but in reality of as great value, as is this great basin, the larger portion of whose surface is below the present sea level, and whose surface is strangely strewn with millions of both fresh-water and marine-fossil shells.

That portion of the desert in San Diego county is rich in mineral wealth, and not destined to always remain agriculturally a desert, even in name.

The Gila desert, in Arizona, is an eastern extension of this arid tract; while on the north the Mohave desert is only separated from it by a low range of sterile mountains.

The Colorado Desert division of San Diego county lies between the San Jacinto range of mountains on the west and the Colorado river on the east, bounded on the south by the Gulf of California and on the north by the eastern extension of the San Bernardino range, which separates it from the Mohave Desert section of San Bernardino county. The peak of San Jacinto, at the northern line of the county, is the highest land in California south of Mount San Bernardino, and rises precipitously from the plains of the desert to the hight of 9000 feet. Its snow-crowned, pine-clad summit appears in strong contrast to the naked, heated plains at its eastern base.

Between San Bernardino and San Jacinto Peaks

There lies the low San Gorgonio pass through which the Southern Pacific railway wends its unimpeded way; and at the summit of this pass is located the thriving town of Beaumont. A few miles farther east is another lively town—Banning, which, with apparently an abundant supply of water, has changed a portion of the desert slope into smiling vineyards and orchards, interspersed with fields of grain. From Beaumont to Indio, for a distance of nearly 50 miles, there is a gradual descent from the fertile lands of San Bernardino valley to the ash-like bed of the famous "Dry lake." This constitutes the Cahuilla valley, bounded on either hand by an austere mountain range some ten miles in average width and 50 miles in length. The wash or drainage from this valley falls into the Dry lake mentioned, and several perennial mountain streams lose themselves very effectually before traversing its howlder-strewn plain. The Whitewater river at times forms a broad, turbulent stream, flowing from the San Bernardino range; while Snow creek and numerous other lesser streams run more or less spasmodically from the treeless northeastern slopes of Peak San Jacinto.

The Southern Pacific R. R., after traversing the full length of this, maintains about the same general direction—southeasterly—across the great cheerless plains of the Colorado desert proper to Yuma, a total distance of nearly 160 miles. The old military post of Fort Yuma was situated on a commanding bluff on the west bank of the Colorado river and therefore in California. The town of Yuma is on the opposite bank in Arizona. Fort Yuma was in the extreme southeastern corner of the State, and enjoyed a truly tropical climate, thanks to the great desert that surrounded it.

The Mineral Belt.

The mountain spurs along the western back of the Colorado river are rich in the precious metals, and mining operations have been carried on there for many years. Besides extensive mines of gold and silver, lead, copper, iron and other valuable metals are known to exist, some of them in immense deposits, but as yet scarcely "prospected."

This rich mineral belt practically extends westward through the entire range of low desert mountains that divide the Mohave and Colorado deserts, but owing mainly to the diffidence of capital to enter a region bearing the name of desert, but little work of development has as yet been accomplished.

On most maps issued in late years there is given an apparently extensive river terminating in the Dry lake. This sometimes appears without a name, but usually it is designated as New river since it has only been known for a few years, and is supposed to have had its origin in overflows of the Colorado river which have occurred in recent years. Twenty years ago

The Colorado River

Was in the habit of annually overflowing its banks during the time of summer freshets when the snows in the mountains around its headwaters melted. This overflow has not occurred since 1884 until the present year, I believe. There has thus been formed a channel through a deep and rich alluvial bottom, which received the name of New river from the earlier pioneers who crossed this desert.

Along the course of this New river the Indians planted and raised most magnificent crops on the lands which were overflowed, as they still do on the lands near the gulf where they have been compelled to retreat. Corn, melons, squashes and other vegetables and grain reached the rankest growth attainable, and those early pioneers yet speak with wonder of the success which these Indians met with in their agricultural labors.

Not only were the cultivated crops large but the natural vegetation along the New River section was equally rank. The grasses and weeds formed an almost impenetrable mass of vegetation—sunflowers became "small-sized trees," a grain of mustard-seed truly gave shelter to the birds of the air and the country very generally belied its name.

This overflow gradually receded into Dry lake, situated in the northern part of the great basin into which New river naturally drained, and there the water disappeared into the deep, porous soil and sand or quickly evaporated before the heat of a tropical sun.

The surface of Dry lake is of a fine sedimentary character, combined with an immense quantity of vegetable matter, consumed by dry rot and forming what may be called a "dry bog." The lake forms the lowest portion of the great basin, is 250 to 300 feet lower than sea level, and owing to the character of its surface, as above described, cannot be traversed.

Fossil Shells.

At Salton, a station a few miles farther east on the railway, the fresh-water shells are found in countless numbers on the surface of the plain, which evidently once formed the bottom of a lake. These fossils are all in a semi-fossil or semi-silicified condition, and are often drifted into windrows, where they may be scraped up by the quart. *Aurnicola longinqua physas, planorbis ammon* and *anodonta Californiensis*—the latter the common fresh-water clam of the Pacific Coast—are the principal fresh water shells detected among this shell debris, but the surface is strewn with these far to the southward to below the United States boundary line, along the course of New river. Probably the whole of the vast area outlined is below the present sea level, and portions are over 300 feet below—Salton being 250 feet lower than the Gulf of California.

The Old Beach-Line of this Ancient Lake

Or sea is well defined along the railway at the base of the mountains, and can easily be traced, always at the same level, for miles and miles along the eastern base of the San Jacinto and Chuckawalla mountain chains. The rocks are worn and rounded up to this line, sharp and ragged above. This line is even with the present sea level, which would seem to suggest that instead of having been a fresh-water lake, this was formerly an arm of the sea, and indicates that the Gulf of California once extended fully 200 miles farther to the northward than it does to-day. Further evidence tends to confirm this view.

Along the west shore of this ancient sea, as we shall call it (what is now known as the Colorado desert)—at present a vast alluvial plain so surrounded by mountains as to form a huge inland basin—there exist enormous deposits of fossils belonging (in my judgment) to the Miocene age. These are largely composed of oyster and allied shells, and extend from below the present sea level to an altitude of probably a thousand feet above. Some of these deposits are hundreds of feet in thickness, forming large mounds and low hills.

It is evident that the sea occupied this basin during the Pliocene epoch up to a late date, for fossils unquestionably belonging to this period are found on the desert, such as the marine *Ocinebra poulsonii* and the *Solecurtus Californianus*—both of which are found living to-day at San Diego. Dozens of the odd valves of the latter are found strewn on the surface of the ground at Salton, in an excellent state of preservation, and in the same semi-silicified condition as the fresh-water shells with which they were associated.

The remarkable point in this connection is the fact that these marine shells and the fresh-water snail-shells *were found associated together, in the same condition, and apparently belonging to the same geological age!*

The *Physa*, the *Planorbis*, the *Anodonta*, and probably the *Aurnicolas* also, are all to be found living to-day in the waters of the Colorado river—the same species whose external skeletons are so numerous and so freely strewn over the great basin.

The Desert and the Gulf.

It can be very readily understood that the sea must have occupied this basin within, geologically, very recent times. The cause of the separation of this ancient arm from the gulf is very apparent, and the same agency in the sediment from the Colorado river is constantly increasing the barrier between them. Doubtless this separation took place within the history of man, for the Indians still preserve the memory of catching fish along the base of the San Jacinto mountains in an ancient sea, and will point out to the stranger the traps or artificial walled-up pools where they caught the fish when the tides receded.

As I have already shown, it is evident that only a few years have elapsed since this whole expanse was a portion of the Gulf of California—a branch separated by a narrow strait since closed by the sediment and debris of the Colorado river. This is the only way by which I can at present account for the presence of the recent marine shells strewn along the edge of the Dry lake. The Colorado river, flowing into the isolated, shallow sea thus formed, soon changed it into brackish and ultimately to comparatively fresh water. The salt of the sea was precipitated by the evaporation that went on into valuable salt mines (that are now being worked), as the evaporation exceeded the inflow. Meantime the marine fauna had perished, except a few which were able to stand the brackish water—such as Solecurtus Californiensis being the last to succumb. The main branch of the Colorado hurried past to the gulf, and only the overflow, surcharged with the fine reddish sediment, reached the basin.

But this was sufficient to form a great depth of the finest and richest of alluvial soil along its route through New river to the Dry lake. Evaporation was rapid. Few years were probably sufficient after this basin was shut off from the sea and the main branch of the Colorado river flowed into the gulf before it virtually became what it is to-day, a barren, desert plain, which occasional overflows are able to convert into a garden of tropical luxuriance.

The Colorado's overflowing its banks doubtless resulted in such a condition of affairs as Dr. R. E. C. Stearns suggests—a system of shallow lagoons just adapted to the multiplying of the pond and river snails from the Colorado. These lagoons must have been of sufficient duration to allow of the maturing of the fresh-water mussel, and still they may have been dry a good portion of the year, as is now the case.

An Inhospitable Region.

Leaving the discussion of the geological problems that confront us to some more convenient time, we will return to the present. It is truly something fearful to contemplate these scorching plains as they exist to-day, with the sun beating down upon the drifting sands with an intensity of heat that often raises the temperature to 130° or even 140° F.

Woe to the adventuresome spirit that ventures unadvisedly at such a time as this upon the stony trails leading into this inhospitable region. Many a man has left his bones to bleach in the clean, white drifts of sand, and the skull of one of these unfortunates rests within my museum as I write. And how many others have left their earthly tenements to decay in poisonous springs of alkaloid or other mineral water, after quaffing their last welcome but fatal drink! Only the coyote and the scorching winds can tell.

Still, many more stand ready to take their chances in the insatiable greed for gold—gold, which if found, might only prove more deceitful than the false mirage—only tempting them on to both temporal and everlasting ruin.

Oh! what beautiful visions arise to the weary eyes. What entrancing landscapes lie spread out before the traveler. Lovely streams of water seem dancing over sands of gold, and placid lakes surrounded with trees and palatial residences invite the unwary to their destruction. What hopeless agony must the poor deluded victims suffer, when, with staring eyes and lolling tongue, they realize too late, and sink to their last rest upon the burning sands. Perhaps, however, they are spared the pain of realization. Let us hope so at least. The hundreds of beautiful variations assumed by this natural phenomenon have often been described, and to one in safety are ever a source of pleasurable wonder and speculation.

Wild Flowers.

There is another side, however, to the picture we have drawn—one more pleasing to contemplate, though it may seem to the uninitiated scarcely less visionary than the optical illusions just mentioned. In early springtime—if there has been sufficient rain, as is *sometimes* the case—these plains are transformed into a vast garden of the choicest flowers in innumerable variety. Every color of the rainbow is imprinted on the smiling faces about you, and the traveler may roam at pleasure among the imperial beauties of a fairy queen's throne-room.

The stately day lily nods its head familiarly to the multitude of humbler flowers that have sworn it allegiance. The foot treads over carpets of vari-colored Gilias. The butterfly tulip startles the eye with its brilliancy, blue-eyed Phacelias, beds of the Golden Eschscholtzia, and numberless other flowers in every form and coloring challenge attention.

The wild fruits and native productions of a country furnish to the thoughtful observer a slight index to its capacity for the production of other fruits and flowers. If capable of growing in a favorable season such wealth of floral beauty, is not this so-called desert capable of better things? If flowers that are destined to "bloom and waste their sweetness on the desert air, and blush unseen," find congenial surroundings here, may we not believe that man may transplant others for his use and delectation?

Palm Trees.

The traveler on the Southern Pacific railway may observe something dark and indefinable against the barren and distant hills near Indio. On investigation this will prove to be a forest of thousands of wild palm trees, the fine Washingtonia filifera, which has become so characteristic of Southern California gardens. Here they grow naturally in the greatest luxuriance, some attaining an estimated hight of over 100 feet. Thousands of others exist in the deep and rugged canyons, where they assume proportions as yet unequaled anywhere by this favorite Californian fan palm where it is in cultivation.

The presence of these trees here in their thriving condition naturally suggests the adaptability of the country for the date palm, which, I believe, is destined to prove an important factor in the future development of this region. The wild palm has provided past generations of Indians with the means of existence in its small, sweet, black fruit; the date may support many future generations of our own race. Its success can scarcely be doubted in the face of experience with the date in Southern California and Arizona.

Irrigating Arid Lands.

No greater problem is before the American people to-day than how they shall treat our arid lands. All portions of the arid regions of the West are capable of the highest degree of cultivation. The key of the situation is irrigation. No part of the vast area termed arid in the West will prove more susceptible to kind treatment than the now feverish, parched, dreary waste—exceeding 5,000,000 acres in extent—designated on modern maps as the Colorado Desert.

California, formerly famous for her wealth of gold, and now equally and justly famed for her excellent fruits, has no more important possession than this neglected southeastern corner, which some day will greatly enhance the fame of our beautiful State.

Future generations may see it become one of the most densely populated and wealthiest sections in the State. Here the date, the banana, the mango, and all the luscious fruits of Asia, Australia and tropical America will flourish as nowhere else within the present limits of the United States.

To review, even briefly, the natural resources, the mineral wealth, the questions of geological moment, of climate and the great horticultural possibilities of this region, would consume a good-sized volume, but I hope the rural population of California may gain a better idea of this portion of the nation's arid lands, and not be entirely ignorant of its existence within our boundaries.

Nevada County Mines.

Grass Valley and Nevada City Districts.

[Written for the PRESS by PROF. GRANVILLE F. FOSTER.]

The wealth of Nevada county, Cal., has hitherto consisted of her vast deposits of gold, and will doubtless so continue for many years to come. The area of the gold-bearing quartz near Grass Valley is small, but it most certainly makes up in quality what it lacks in quantity, for it has unquestionably one of the richest ledges in the world. It is found only in a strip of land, seven miles long by four wide, and is joined on the north to the Nevada City mining district, where the ledges are also very rich. Mining in this locality, when carried on systematically and with proper judgment, has always paid large profits on the amount of capital invested. To this there has been no exception. Gold mining, like any other enterprise, must be carried on with proper economy and with careful attention to details if success is to be attained. The days have long since passed away in which fortunes could be picked up off the ground or obtained by a little labor of individuals with pick, pan and rocker. It now requires capital and enterprise—money and brains—to make gold mining profitable to those engaged in it. But given these, and so far as the Grass Valley mining region is concerned, success has followed in the past and must follow in the future.

The Famous Idaho Mine.

The principal mine is, of course, the far-famed Idaho. The ledge upon which this mine is located was formerly known as the Eureka, and was opened first in 1865. It is situated about two miles east of town on the east bank of Wolf creek. At first the stockholders used steam-power for mining and milling purposes, and during the last year that this was true the enormous quantity of 8500 cords of wood were consumed. About this time two enterprising Englishmen, Edward and John Coleman, brothers, who had before been the principal stockholders, became also the managers of the mine and the running expenses were reduced materially. First water-power was substituted for steam power, and finally the most approved machinery was introduced, until it can be said without question that this is the best-managed mine in the whole world. At present there are between two and three hundred men employed in the mine. The yield to the end of the fiscal year 1888, according to official reports, was $9,207,227.25 worth of gold. It has probably now reached nearly $11,000 000. The running expenses per week average $5100.

The Maryland Mine

Is situated northeast of and adjoining the Idaho, and upon the same ledge—a ledge of surpassing richness. The capital stock of the company is divided into 500,000 shares, of which S. P. Dorsey, Esq., of Grass Valley, owns three-fourths and controls four-fifths. Among other stockholders are the Coleman Brothers of the Idaho mine, and W. W. Young of San Francisco. *A priori*, this mine would be considered exceedingly rich without directly testing, since

it is situated on the same ledge as that of the Idaho, but an unexpected proof of its unusual richness has lately appeared. For some time past the workmen of the Idaho have been operating just on the border of the Maryland, and the fact comes to light that the nearer the workings reach the boundary line of the two mines the richer the quartz becomes. Mr. Dorsey has been offered large sums for his interest in the mine—sums in some cases approaching half a million dollars, but he has invariably refused all, for though willing to sell shares enough to yield sufficient money to develop more fully the mine, he is unwilling to lose his control. It is the conviction of many eminent mining men that the Maryland will yet eclipse the famous Idaho, and since the latter is reaching the period when it will be worked out, the former must soon be fully opened up and its subterranean wealth brought to light. Upon the Maryland a shaft has already been sunk to 400 feet and hoisting works are in place.

The Empire Mine

Is one of the oldest in the vicinity. It is still worked to better advantage than ever before. The value of its ore averages $12 per ton, costing some $7 to mine and reduce, leaving a profit to enumerate all the mines in the vicinity of Grass Valley, since new ones are being constantly opened. At the present time there is certainly no indication that the wealth underground is being exhausted to any appreciable extent.

Nevada City District.

The other mining district in the vicinity of Nevada City presents some valuable mines which are now yielding well, but the district is not so rich, so far as its gold-bearing quartz is concerned, as that of Grass Valley. Nevada City formerly depended upon its hydraulic mining for its wealth, but since the strong finger of Uncle Sam has been placed on this wealth-yielding enterprise the city has been declining in population. It is a shame that the millions on millions of wealth lying in the sands of the hills around Nevada City must remain unearthed that the navigation of an insignificant stream might be conserved for the benefit of the few. If these millions of dollars' worth of gold now condemned to lie unearthed could be put into the market, all enterprises, even that of farming in the valley, would feel the invigorating impulse. It is to be feared that the farmers who have succeeded in causing hydraulic mining in the Sierras to cease, are like the man who killed the goose that laid the golden egg. The money that would be derived from hydraulic mining in one month would be worth more than the whole commerce of the little Sacramento in a year.

Since the ceasing of hydraulic mining many persons in the county have commenced fruit-raising, and no region in the State is better adapted to the raising of the apple, pear and peach than this.

Grass Valley, Cal., August, 1890.

HONEST MINERS.—A dozen years ago a company was organized to develop a mine at Unionville. There were several practical miners, whose capital consisted of willing hands, says the *Silver State*, and a lawyer and a hotel-keeper in the company. Thousands of dollars were expended in labor on the mine, and, as the price of silver continued to depreciate, the ore would not pay to ship and the company had not means to erect reduction works on the ground. Operations were suspended and an account stated acknowledging an indebtedness of $9000 to the hotel-keeper was signed by all the members of the company except the lawyer. That was 10 years ago and no effort was since made to collect the account. Recently the company sold the mine and the first instalment of the purchase-money, amounting to over $12,000, was paid here two days ago. The miners and the lawyer, too, none of whom are overburdened with worldly wealth, promptly paid the $9000 though it had been outlawed for years, and like honest men congratulated each other on being able to cancel a just debt. Such men are truly the noblest work of God.

The Gold Belt of Northern California.

Ancient River Channels and Gravel Deposits.

NUMBER XII—SUPPLEMENTARY.

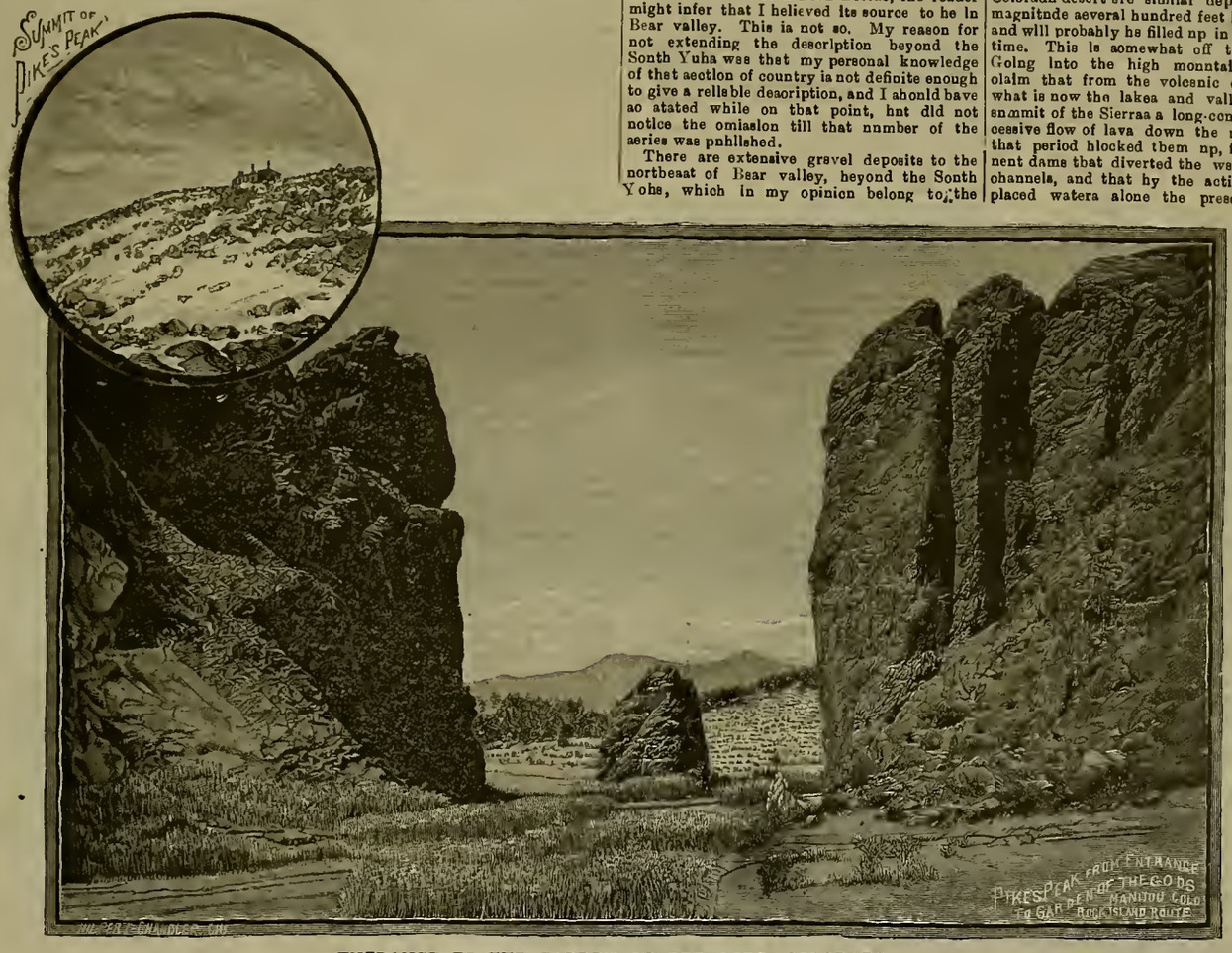
[Written for the MINING AND SCIENTIFIC PRESS by JAMES F. TALBOTT, Blue Canyon, Placer Co.]

[The concluding number of Mr. Talbott's articles was printed in the MINING AND SCIENTIFIC PRESS of August 23d, page 120. This week we publish a supplementary article, which, while not originally belonging to the series, sums up briefly the points on which the "river theory" is based.—EDS. PRESS.]

In concluding this paper, which has been extended to a greater length than was intended in the outset, I deem an apology and some explanation due the reader. For any repetition or apparent want of connection on the different points, my excuse is that the most of it was written up of evenings after the day's work in the mine, and that I have done my very best. In explanation of my description of the ancient channel of the North Fork Divide, the reader might infer that I believed its source to be in Bear valley. This is not so. My reason for not extending the description beyond the South Yuba was that my personal knowledge of that section of country is not definite enough to give a reliable description, and I should have so stated while on that point, but did not notice the omission till that number of the series was published.

There are extensive gravel deposits to the northeast of Bear valley, beyond the South Yoba, which in my opinion belong to the ere what is now termed the "ancient channels," and it is possible that the fine gold now being mined in the sands of the ocean beach was carried there by some of these rivers before the uplift of the Coast Range of mountains. It is possible, too, that the great revolution that obliterated this system of rivers was ushered in by the vast uplift of the Coast Range in a continuous unbroken line, and a subsidence of the land to an unknown depth and extent between the Coast Range and the foothills of the Sierras, with a simultaneous volcanic outburst along the Sierra Nevada mountains.

This immense depression (known to be more than 1500 feet in depth from the sinking of the gas well at Stockton, which was in fine washed gravel when they stopped boring) formed a vast dump, which has taken all the material displaced between the lava ridges and an unknown quantity of volcanic debris to fill up. This missing material can be accounted for in no other way. The accumulated waters evidently covered this deposit to a considerable depth till the gap through the Coast Range at the Golden Gate was cut out and gave an outlet for the water, leaving a vast extent of fertile land above sea level. Death valley and the Colorado desert are similar depressions of less magnitude several hundred feet below sea level, and will probably be filled up in the course of time. This is somewhat off the main line. Going into the high mountain region, we claim that from the volcanic outburst from what is now the lakes and valleys along the summit of the Sierras a long-continued and excessive flow of lava down the main rivers of that period blocked them up, forming permanent dams that diverted the water into other channels, and that by the action of the displaced waters alone the present system of



ENTRANCE TO THE GARDEN OF THE GODS, COLORADO.

rivers, canyons, ravines and deep gravel deposits were formed.

The Garden of the Gods.

The illustration on this page shows the entrance to the famous Garden of the Gods, located near Manitou Springs, Colorado. In the foreground, as shown in our view, are seen the massive walls of red sandstone rising on either side of the opening to the height of 100 or 150 feet. The wall was originally continuous, but has been worn through by erosion. In the background, through the opening, may be seen the snow-capped summits of Pike's Peak, rising to a height of 14,000 feet above the sea level. Of this locality, Prof Hayden writes in his report as follows:

This interesting and peculiar place is a valley in the foothills of the range, and is inclosed by an almost vertical wall of massive sandstone of Cretaceous age. The rocks which we find inside have been subjected to an immense deal of erosion, and the many ridges and tower-like forms left standing throughout the garden are the remnants of the parallel strata which dip to the northeast at a very great angle. In some places they seem to dip a few degrees in the opposite direction. As we go toward the mountains, the dip decreases. These rocks are fine-grained sandstones of a deep brick-red color, with here and there layers and spots of a lighter red, and sometimes white. The ridges are exposed for some distance to the north, while to the south, after bending toward the East, they appear to be covered by the debris from the mountains. The entrance to the "garden" is through the "Beautiful Gate."

of $5 on the same amount. To make such a profit under the circumstances requires the most approved modern appliances and the most rigid economy in the administration, and here in all these things the company has acted according to the dictates of the highest wisdom. Area of mine, 5000 feet by 750 feet; number of stamps in operation, 40.

The North Star

Is an old mine. Early worked out, so far as crude appliances and uneconomical plans then in vogue were concerned, it lay idle from 1872 to 1882. In the latter year a French company took it, pumped out the water, soon sank the shaft deeper until it has a vertical depth of more than 1500 feet, bought the finest appliances in existence to hoist and reduce the ore. They commenced work with a determination to preserve an unvarying economy in everything done, and hence it is now one of the best paying mines in the State. The mine is southwest of Grass Valley, and is situated in a most picturesque spot where the glories of the mountain and beauties of the great valley are both in full view.

Other Mines.

Around the North Star are clustered the Inkerman, the Fahey, the White Oak, the Bowery, the Vulcan, the Irish-American, the Home, and other mines. Around the Allison Ranch mine, four miles below Grass Valley, on Wolf creek (a mine that has yielded $5 000,000), are to be found the Malone, the New Idria, the Golden Chain Syndicate, the Ajax, the Franklin, and other mines. Besides these, there are the Phœnix, the Megenta, the Sebastopol, the Osborne Hill and the Orleans. It is impossible

North Fork system, and of which I may have something to say in the future. In closing this article, I earnestly protest against "substituting" Prof. Hanks' new theory of the deep-gravel deposits for one that I have been a firm advocate of for 30 years. Although "defective," I still adhere to it. I am willing Prof. Hanks or any one else may get up and advocate any theory that suits them, but I object to substituting any new theory until its practical advantages and benefits are demonstrated. Not wishing to enter into a controversy with so eminent a scientific gentleman, I will leave the subject in the hands of some of my co-believers in the river theory (without detracting in the least from the professor's ability), many of whom are his equal in the profession and have more leisure and ability than I. It is evident from the professor's paper on his new theory that scientific men "day-dream and theorize" as well as "miners and prospectors."

Without noticing any objections to the new theory, I will sum up the main points upon which the river theory is based. The "intelligent miner" can read the paper on the new theory and decide which theory be "wholly rejects or retains with doubt." Admitting some repetition, the river theory as I understand and advocate it, assumes that at some period of time of which the most learned geologist has no more positive knowledge than an observant miner, a system of rivers somewhat similar to the present ones, drained the country from the summit of the Sierras to the sea, and contained what we term the original deposit of gold, the gold originating or being formed in quartz ledges by some process that the miner seldom bothers his head with. The beds of these rivers

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

KENNEDY.—*Ledger*, Aug. 30: This company has taken steps toward the erection of chlorination works. The site has been selected on the hill above the office, and grading has already commenced. G. F. Deakin has secured the contract for the erection of the works, and he expects to have them in running order in six weeks. The outside building is to be a frame structure, and the ovens are to have a capacity of 2½ tons per day. This new enterprise is another demonstration of the faith of the owners in the permanent character of this mine, and the people of this vicinity will be pleased to hear of this additional evidence of prosperity. The mine continues to look encouragingly. The sinking operations in the north shaft are considerably retarded on account of the large volume of water encountered. The mill is kept running to its full capacity on rock from the south shaft.

PLYMOUTH CON. GOLD M. CO.—The following financial statement is made public by the management, to Aug. 1st:

Surplus, Jan. 1, 1890	$28,141 42
Gold bullion produced March	2 969 90
From Utica Mining Co., for use of mill	542 52
Wood sold	1, 04 00
Gold bullion produced April	5 055 63
" " May	6 041 37
" " June	7,572 05
" " July	5,649 93
Copper plates melted up	1,770 95
Total	$58,746 77
January expenses	$3.975 05
February "	3.762 57
March "	4.298 19
April "	5.075 63
May "	6 443 17
June "	5 961 37
July " estimated	6,000 00
	$35,510 98
Surplus	$23 235 79

During July the mill was run mostly on the low-grade rock of No. 3. Only about 15 per cent of quantity crushed came from the better rock of No. 2. The sulphurets are yet to be added to the amount given, increasing it to something over $8000. There is very little change to note in the mine. The superintendent reports that the ore body on No. 2 has widened a little and looks well.

MISCELLANEOUS.—The mill of the Amador gold mine is kept running to about half its capacity. A large quantity of sulpburets has accumulated—from 50 to 60 tons. It is reported that they will be kept for treatment on the ground, which means the erection of chlorination works.

FROM SUTTER CREEK.—Cor. Amador *Ledger*, Aug. 30: Grading for the addition to the Wildman mill was commenced on Monday, and in a few days everything will be in readiness for the woodwork. There is a large force of men on grading for the new 15-inch steel pipe to run the hoisting works, which is a distance of about three-quarters of a mile. Some of the digging is blasting ground which will naturally retard their progress to some extent, hut Mr. Tregloan has got some experienced miners on the job and is pushing it with all possible speed. The carpenters are at work putting up a large ore-bin at the hoisting works. Sinking at the Rose mine has been resumed. The air pipes are all in, which improves the air so that the miners can work with perfect safety. The ledge as they go down improves, and indications are encouraging. Preparations are being made for permanent work at the Sutter creek mine. The mill is pretty well torn up and will he rehuilt. The new mortars being made at Knight's foundry are about finished. Mr. Stewart is running the Lincoln mill steadily. The ore being crushed is of a paying character, and appears to improve as developments progress.

Calaveras.

LAVA BED GRAVEL MINE.—*Prospect*, Aug. 30: Lampson & Evans are sinking a third shaft on their mine near Railroad Flat. These gentlemen have been working their mine for about two years. Last fall they washed up about 300 tons of gravel at an average of $12.50 per ton. Mr. Lampson informs us that the channel is from 40 to 100 feet wide, and as far as prospected the average depth is 6 feet. There is a 15-horse power steam hoist, pumps, etc., on the mine and everything is in good running order. The outlook at present is favorable to a small hoom in gravel mining in that portion of the county.

Inyo.

DARWIN.—*Index*, Aug. 27: Parties who recently visited the old reliable camp say that a marked improvement in mining affairs there is certain to come soon. The water supply which has been short for a long time will be ample and assured with the new pipe now about all laid. The Defiance mine is said to look better than ever before; more ore in sight and of higher grade. As soon as the water works are completed the men will he transferred to the mine. Jim McDonald is in charge as superintendent, and Geo. H. Hardy, hook-keeper. Other mines will start up with the advent of cooler weather.

CERRO GORDO doesn't boom much, out the Danphy & O'Keefe mine is producing 30 tons of rich ore per week with the utmost regularity, only a small force being employed. Developments in the Union are progressing quietly. A largely increased ore output from both mines will follow the running of daily trains.

SAN CARLOS.—Inyo *Independent*, Aug. 29: The tunnel that has been so long in progress at the San Carlos mine was expected to strike the ledge several weeks ago. It has been found that some distance above the tunnel the ledge is bent to the northwest, and this is why it was not reached sooner. The face of the tunnel at last report showed that the ledge was very near, and ore might he struck at any time.

SYLVANIA.—George Thorpe from Sylvania reports that the engine for the hoisting works is nearly ready for work. The furnace will not he ready for use much sooner than October 1st. The principal mine shaft is being timbered into two divisions. A large boarding-house and another building for a store will be completed as soon as possihle. About 75 men, all told, are employed at the camp.

Nevada.

SNOW POINT PROSPERING. — *Transcript*, Aug. 28: The gravel mining interests at Snow Point, on the Middle Yuha river above Moore's Flat, are prospering. John T. Cline and son are taking some good dirt and think they are in the channel they have so long heen looking for. Hegarty & Blackwell last fall had 20 tons of gravel on the dump when the snow came on shutting off the water, and they left it there. When the men went back to resume work they found among other good things that the "natural wash" had exposed on the dump an $80 nugget. The McKillican claim continues to yield satisfactory returns. Snow Point promises to become an important drift-mining center. The work done there so far in this line has been mostly of a prospective character, but the developments are sufficiently advanced to warrant a strong helief that the channel is fully as extensive and valuable as was predicted of it.

Sierra.

DRIFTING. — *Mountain Messenger*, Aug. 30: Work has been recommenced on the Excelsior drift mine in Cedar Grove ravine, stopped owing to the tunnel heing in so far that the fire draft would not furnish any more air. We expect something will be done in the near future to remedy this defect.

MOUNTAIN.—The iron work for the Mountain quartz-mill has nearly all been taken from the Downieville foundry. The men who are putting the mill together say they never put one up where all the various parts went togetber with less trouble than this one.

GOLD LAKE DISTRICT.—*Tribune*, Aug. 30: The Glidden quartz mine, situated half-way between Gold Lake and Gold Valley, is closed down at present. It has a 10-stamp mill and has been worked quite extensively. Some very rich ore has been taken out and it is said that if the mine had been properly managed there would have been no occasion for its closing up shop. The Lone Star mine, of which Joseph Snyder of Grass Valley is superintendent, is in operation. A contract to run the tunnel 600 feet bas been let to Mr. Snyder. Six men are employed. Several tons of ore were run through the Garibaldi mill and it paid over $12 a ton. The 5-stamp mill at the Garibaldi mill is running steadily. At tbe Empire mine in Gold Valley the tunnel is heing pushed ahead. The company propose to erect a mill there next season.

AT THE YOUNG AMERICA MINE.—Mr. G. W. Hughes has been elected superintendent of the Young America mine to succeed P. Deidesheimer. Mr. Hughes is no novice at the business of mining. For many years he was a resident of this banner mining county and for a long period was actively engaged in that branch of industry. In the palmy days of the Keystone when that mine was under the control of H. Scammon, the Downieville banker, Mr. Hughes, was its superintendent. In addition to a long practical experience in the management of mines, Mr. H. possesses a large fund of good, hard business sense, combined with strict integrity. The Young America Mining Co.'s interests will undoubtedly be in good hands with Wasb Hughes at tbe helm.

Trinity.

NEW RIVER MINES.—Cor. Siskiyou *Telegram*, Aug. 26: Mr. Albert Yocum arrived from the New River mines Saturday. From him we obtained the following information in regard to the prospects of the camp: The Mountain Boomer Co. is sinking down deeper on its mine in the hard formation; it has a good-sized ledge of rock which will go $80 per ton. Charley Williams, who bas a lease on the Sherwood mine, is taking out a large amount of ore, the richest yet taken of the mine, estimated at over $100 per ton. The Uncle Sam Co. has its ore dumps all full of ore which goes about $15 to the ton. The mine is showing up better than ever; the ore is not so rich as other mines in the camp, but it shows more ore and is the best defined ledge in the camp. Tbe Ridgeway Co. bas taken on a new lease of life and is now running an upraise from the tunnel to tap the shaft. This company has spent a large amount of money during the last year running a 750-foot bedrock tunnel which taps the mine much deeper than the old works, but unfortunately for them they have not as yet found any ore that will pay. It has also erected a fine 10-stamp mill on the property. The Tough Nut and Irwin mines are also taking out good rock and expect to bave good cleanups.

NEVADA.

Washoe District.

ALTA.—*Enterprise*, Aug. 30: The average battery samples this week were $23.80 per ton, and about 300 tons were crushed. Drifting northwest from the shaft on the 1000 level and cutting stringers of ore. Drifting a west branch from the northwest drift on the 725 level, and cut about a foot-wide stringer of very fair ore.

YELLOW JACKET.—Shipping daily 85 tons of $21 rock.

UTAH.—The main north drift on the 725 level has been extended 54 feet; total length, 406 feet. The formation continues vein porphyry, clay and some quartz.

OVERMAN.—Extracted and hoisted from the 1200 level 361 tons ore. Car samples average $16.27 per ton. Shipped to the Brunswick mill 396 tons of ore. Battery average, $19.19 per ton. Of this, $11 per ton is gold. Incline upraise to the northeast from eleventh floor of the stope is up 37 feet. Material, porphyry, with seams of clay and quartz. On the 20th instant shipped three bars of bullion valued at $11,514.81.

SEG. BELCHER AND MIDES.—The joint 1300 winze has been sunk 17 feet during the week, making its deptb 97 feet. The bottom is in a mixture of porphyry and low-grade quartz.

CROWN POINT.—Shipped to the Mexican mill during the week 644 tons 1930 pounds of ore, the average battery assay of which was $17.13 per ton.

BELCHER.—The 200 level north drift from the west crosscut is advanced 231 feet. The face is in favorable-looking ground composed of quartz, porphyry and clay. The 300 level west crosscut from the shaft is out 535 feet and bas reached what is believed to be the footwall. It has passed through a ledge of low-grade quartz during the past week about 25 feet wide. Lateral drifts in the quartz will he started at once. Shipped to the Vivian mill during the week 306 tons of ore, the average assay of which was $22.82 per ton.

JUSTICE.—We have done no work on the 622 north drift during the past week. Shipped to the mill during the week 192 tons of ore, the average battery assay of which was $26.54 per ton.

CHALLENGE AND CONFIDENCE.—The joint Confidence-Challenge and Imperial west crosscut No. 2 on the 1000 level is out 384 feet; 24 feet made during the week. Face shows quartz of no value. Joint Confidence-Challenge-Imperial north lateral drift on the same level is in 545 feet and has been connected with the Imperial new shaft.

SAVAGE.—On the 300 level No. 1 west crosscut is advanced 33 feet, making its total distance 155 feet. No. 2 west crosscut from tbe face of the north drift is advanced 37 feet, making its total distance 65 feet; face in low-grade ore. During the week we have hoisted from the several levels 654 cars of ore. Shipped to the Rock Point mill 499 tons and milled 456 tons; average battery assay, $19.20 per ton. Have hullion on hand and at tbe mill, $20,400. The battery assay of the past week was low, but it does not represent the good ore on the 1300 level, which has not yet heen shipped to the mill.

HALE & NORCROSS.—On the 900 level we have commenced stoping ore. This level shows considerable ore, but most of it is low grade. We will also stope ore from the 1200 and 1300 levels. On the 1250 level the west crosscut started opposite the south upraise from the 1300 level has reached the west wall and bas been stopped. This crosscut sbows a large body of low-grade quartz. Milled 620 tons of $23 ore as per average battery sample assays.

IMPERIAL.—West crosscut No. 3 from the 500 level north lateral drift is being repaired. West crosscut No. 3 from the 750 level north lateral drift is out 418 feet, having been advanced 25 feet; face shows porphyry. West crosscut No. 1, 1000 level, is out 310 feet; 17 feet made during the week; face sbows quartz having no value.

ANDES.—On the 420 level a north drift from No. 1 crosscut is extended to 41 feet; formation, porphyry and quartz giving low assays. South from No. 2 crosscut extended to 21 feet; formation as above.

OCCIDENTAL.—Extracting fair-grade ore from the stopes on the 400 and 450 levels. The winze from tbe west crosscut on the north line, 550 level, is down 117 feet, the bottom being in quartz and porphyry. East crosscut on the north line, 550 level, is out 276 feet. The face is still in clay and porphyry.

CHOLLAR.—East crosscut No. 2, 80 feet soutb of north line, 800 level, bas been advanced 80 feet; total length 144 feet; face in hard porphyry. During the past week 490 tons of ore bave been milled, average battery assay of which was $20.65 a ton.

POTOSI.—North drift, 1030 level, is out 51 feet; face in a mixture of quartz, clay and porphyry. The winze is down helow the 930 level 374 feet on the slope. The bottom is in porphyry and quartz.

EXCHEQUER.—East crosscut, 150 feet south of the north line, 500 level, is out 98 feet; face in clay and porphyry. The north lateral drift, 620 level, is out 435 feet; face in hard rock.

ALPHA.—Soutbwest crosscut, 600 level, is out 186 feet; face in bard porphyry. Northeast crosscut, 600 level, is out 44 feet; face in soft porphyry and small seams of qnartz.

NEW YORK CON.—North lateral drift, 800 level, from No. 1 west crosscut, is out 373 feet; face in clay and porphyry. The north drift, 650 level, is out 47 feet; face in porphyry. North drift, 1100 level, is out 135 feet; face in quartz and porphyry.

SILVER HILL. — The northeast drift from the winze, 160 level, advanced 20 feet; total, 330 feet; formation, porphyry. The southeast drift on the 260 level advanced 10 feet through porphyry and quartz; total length, 335 feet. Northeast drift, 334 level, advanced 20 feet through hard porphyry; total length, 370 feet.

WARD COMBINATION SHAFT.—East drift from the 1800 station is now out a distance of 518 feet; face in hard porphyry.

BEST & BELCHER.—Upraise No. 1 has been carried up a distance of 10 feet, total bigbt, 29 feet; formation, hard porphyry.

GOULD & CURRY.—On the 300 level, west crosscut No. 1 has been cleaned out and repaired 100 feet. South drift from west crosscut No. 1 has been cleaned out and repaired 115 feet. On the 625 level, the south drift has been repaired 30 feet; total distance, 235 feet.

Eureka District.

ORE SHIPMENTS.—*Sentinel*, Aug. 30: During the week tbe Eureka & Palisade R. R. Co. shipped 235 tons of ore to the Salt Lake smelting works.

SALE OF MINING PROPERTY.—Last Saturday G. C. Brown sold his third interest in the Rob Roy mine and mill belonging thereto. He also disposed of his interest in some ten other claims in this district. The purchasers were Capt. Carpenter and Mr. Eggleston of Kansas, who have been operating here for several months.

CLOSED DOWN.—The Eureka Con. works were closed down for repairs last Monday. It will require some two weeks to make the necessary repairs and improvements.

Highland District.

MINING AND PROSPECTING.—Pioche *Record*, Aug. 28: Mining matters in Highland district are picking up, and besides the Mendha and Hamburg mines whicb are worked by the Yuha M. Co., an unusual amount of prospecting is going on.

THE HAMBURG is on tbe same ledge as the Mendha and is also the property of the Yuha M. Co. It promises to become a good paying mine before the winter sets in. At present work is going on in an incline in which a small streak of ore shows well, and all indications point to the opening of a good body ere long. The Hamburg is situated about 600 feet east of the Mendha, and is also under the cbarge of D. Baker.

THE MENDHA MINE, which was purchased some months ago by the Yuha M. Co., is at present working a force of 12 men. The work so far has been on the second level, and in the face of the drift, whicb is about 200 feet from the shaft, a fine body of lead ore, a foot in width, shows up which will average about 80 ounces of silver and 60 per cent lead per ton. Preparations are now being made to commence work at the bottom of the shaft, which is about 80 feet below the second level, and to run a drift parallel with tbe ore on tbe second level. The old guides and ladders have all rotted away and will have to be replaced. At present a whim is in use, but a steam hoisting plant is to be put up immediately. The engine is now in the machine shop at the Raymond Works here undergoing repairs, and will be shipped out and put up as soon as finished. Ore is being daily hauled to the furnace, by teams, the distance being about eight miles. The mine is under the foremanship of Dan Baker.

THE MINERVA.—Preparations are being made to develop this property by Mr. O. C. Perry of San Francisco, who purchased the property some two months ago while down here. We understand that he has purchased a carload of supplies and will be here the latter part of this month to begin active work. Water is now hauled to the mines from town hy the ore-haulers, which under the circumstances is more convenient than bringing it from the brewery.

Tuscarora District.

YOUNG AMERICA SOUTH.—*Times Review*, Aug. 29: West drift, first level, extended 10 feet. North drift, second level, extended 22 feet. Stopes producing some good ore.

DEL MONTE.—Stopes being opened south of the line are improving. Will resume work Monday at several different points.

NAVAJO.—Work has been resumed in the 250-foot level stopes, which are producing a good grade of ore.

NEVADA QUEEN.—The North Belle Isle Co. is pushing the drift on ore toward the line, which will he reached in four or five days; will then be turned over and run on company's account to develop the ore on 550-foot level.

NORTH BELLE ISLE.—The stopes on the 150-foot level are looking better. No. 3 upraise from 600-foot level extended 8 feet, no change. A crosscut has been started from the top of this raise toward the footwall and advanced two feet, all in vein. No. 2 upraise, 600-foot level, extended 13 feet, showing seams of fair ore.

BELLE ISLE.—No. 1 upraise above the 250-foot level bas been started, progress three feet, exposing four inches of high-grade ore. Have resumed work in the face of No. 1 crosscut same place. Water in the Navajo shaft is now down 46 feet below the 350-foot level.

NORTH COMMONWEALTH.—670 tons of ore sent to concentrator; 60,000 pounds of concentrates made, assay $171 per ton; 70 tons of first-class ore sent to the mill, average assay $229 per ton, tailings $12.63.

COMMONWEALTH.—Hoisted 328 cars of concentrating ore, car sample assays $19 per ton, assay of concentrates $781 per ton, assay of ore sent to mill $199 per ton. Bullion shipped $24,311.75. Crude hullion on hand about $12,000. The furnaces have been changed, all running and doing good work.

ARIZONA.

PLACER GOLD.—Prescott *Journal-Miner*, Aug. 27: Ed Wagoner is in from Walnut Grove to-day with a large supply of placer gold which he secured in exchange for merchandise. He says that placer miners are doing well in that section. Mr. Storms, of mining repute, left this morning for the Hassayampa, to resume operations on the Ohio claim, which is said to he very fine. Tim Hawkins' Rosa Lee mine was sold by the sheriff to-day to satisfy a judgment in favor of George Hagarty. The latter was the purchaser. N. J. Hyde, who has been engaged in mining on Cherry creek district, says that himself and partners have an excellent prospect there, and will shortly erect a mill for the reduction of the ore. Two very fine specimens of ore from the Senator mine are on exhibition at the Fashion saloon. One is from above the 600-foot level, and the other from above the 500-foot level. Machinery for the new large hoist of the Congress mine passed through town a few days since. The Ryland Co. at Minnehaha will shortly put in a chlorination plant to work their concentrates. The Kansas City M. Co. has just received a steam drill, which will he put at work as soon as it can he placed in position on the Silver King mine, and the shaft will be sunk as rapidly as possible to a depth of 500 feet. The rapid rise in silver has given quite an impetus to silver mining again. Many properties in this section can now he worked at a profit that would not pay expenses before. Geo. B. McCann received a ton of onyx from the Big Bug mine, a few days since, which he has forwarded to California.

MOHAVE NOTES.—*Miner*, Aug. 30: Work on the Empire shaft is progressing as well as could be expected, owing to the nature of the ground. The leasers on the mine are doing well. Samuels and Krause, who have a lease on the Jeanette, south of Hackberry, are taking out some good ore, and will soon have a carload ready for shipment. Twiggs & Kelley have taken the contract to run 200 feet of drifts on the Esmeralda mine. The contract is at good figures, and they expect to make a good stake out of it. The mill of the Music Mountain Mining Co. in Wallapai valley is completed, and on the arrival of a few additional pieces of new machinery, the mill will he put in operation. Carey and Merrill have a carload of ore at the Kingman Sampling Works from the Cactus, south of Hackberry. They have been at work on this property for some time, and have considerable ore yet in sight.

COLORADO.

SILENT FRIEND SALE.—Aspen *Times*, Aug. 26: M. Murphy has sold his interest in the Silent Friend, at Pitkin, to the other members of the company. He held a one-eigbth interest, which practically cost him nothing, as he was the promoter of the enterprise. The amount realized by bim from his connection with the property reaches a handsome figure, it heing variously estimated at from $10,000 to $15,000.

THE PARK CLAIM.—A plant of machinery is heing erected on the Park claim on Richmond hill by John Scott and party, who have secured a lease on it. They intend to push development work vigorously and will spare no expense that may he needed to make a mine of it. The property helongs to Wm. O'Brien, Brennan Bros., Toomey Bros. and others.

DAKOTA.

TIN AND GOLD. — Deadwood *Pioneer*, Aug. 28 While at Bear gulch last Saturday, Inspector of Mines Corkhill saw tin and gold taken out of the same rocker. The gold was what is known as coarse

placer and the nuggets of tin were about the size of an English cherry.

UNION MINING CO.—The directors of the Union M. Co. held a meeting yesterday and levied a small assessment sufficient to do representation work. The company owns two claims on Fantail gulch that promise to develop into good properties.

NIGGER HILL AND BEAR GULCH.—Inspector of Mines Corkhill returned last evening from an official visit to this district. He is firmly convinced that Nigger hill has un in paying quantities. At Bear gulch he found about 40 men engaged in placer mining, or rather rocking, for gold, as the stream does not carry enough water to run a sluice. Everything in the camp reminded him of early days in Deadwood gulch, as every miner carries his buckskin bag of gold, and dust is the currency of the camp. The miners only work about five hours a day, but they clean up as high as $30 per man per week. They take their dust to the store, exchange it for goods and leave the balance on deposit, or to be shipped to Deadwood by the store-keeper. The majority of the miners have been in the camp for 10, 12 and even 14 years. They work their claims six or seven months in the summer season, and then some of them take life easy until the following spring opens, while others spend the winter developing tin or gold and silver quartz claims.

IDAHO.

YREKA DISTRICT.—Wardner *News*, Aug. 26: The air compresser of the Last Chance mine was started on last Sunday and is now working very smoothly. A night shift will be put on to-morrow in the concentrator and in future the mill will be kept going day and night.

GOVERNMENT GULCH.—Work was resumed on the Silver King group of mines on March 23d, and since then operations have progressed without interruption. For the last five weeks two shifts have been employed day and night and during the last two weeks a body of good galena ore was encountered on the lowest level, four feet wide. This group of mines consists of the Silver King, Silver Queen and Merry Fraction. They are owned by H. A. Jones, William Merry, George Gardiner, O. L. Shankland and George Cox. The ore chute is exposed for a distance of 80 feet in length and 40 feet high.

LOWER CALIFORNIA.

OUR MINERAL RESOURCES.—*Lower Californian*, Aug. 20: A miner who recently came into Ensenada from a prospecting trip which extended over a large part of the country between here and the Gulf and as far south as Valladares, likened the peninsula of Lower California to one immense ledge of quartz, the monotony of which was only relieved here and there by an emerald valley upon whose bosom the ingenuity of man will ere long cause the semi-tropical products indigenous to this latitude to flourish in luxurious abundance. It is his belief, he said, that in the years to come the doors of this storehouse of mineral riches must yield to the pressure of human perseverance and disclose to the world the greatest mineral wealth that has yet been uncovered. It is an era that will surely come. There is not a portion of Lower California of any notable area that has not some mineral or plant for which there is a constant demand in the markets of the world. We have here gold, silver, copper, chromium, iron, antimony, onyx, carnelian, asbestos, mineral paint, hemp, henequen, talc, salt, and other products which await the advent of capital to become thriving industries.

BELOW CEDROS ISLAND.—Vincent Wallace of San Diego came up on the Pacheco last Monday from Cedros Island. He has been prospecting for gold and silver on the island and on the mainland. With other prospectors he lately went down to the coast in the schooner Queen a distance of 150 miles south of the island, and reports having found several fine prospects, besides five or six magnificent sulphur springs. The latter were located about 12 miles back from the coast and were fully appreciated by the men, for it was the first fresh water they had encountered since leaving the island. Mr. Wallace describes the coast of the peninsula south of Cedros as extremely desolate, the foothills being back some distance from the shore.

MONTANA.

CASTLE DISTRICT.—Anaconda *Review*, Aug. 28: In Castle district there seems to be an increased activity in the development of properties that have shown themselves good for anything. New companies are being organized and work is being prosecuted as rapidly as possible on numerous claims. Among the new companies are the Myrtle, Monte Cristo and the Southern Castle. The Cumberland Co. has commenced a three-compartment shaft from which the various properties of the company will be worked. Manager Belden of the Red Lion was in town Tuesday on his way to Butte with a fine retort of gold, about 90 fine, the result of three or four days' run of the mill. The retort represented $500. The company is running the ten-stamp mill in its fullest capacity and is getting good results. About 20 men are at work in the mine.

DUNKLEBERG.—Another good strike is reported to the *Mail* in the Dunkleberg district this week. It is on the Pioneer and Annie lodes, which are under lease and bond to A. P. Morgan and Wm. Funk. The strike was made in the 300-foot level of the Jackson shaft. They have started a new shaft and are down about 24 feet, and have an 18-inch vein of good ore in sight. The ore will average 40 to 50 ounces, and the lessees in consequence feel quite jubilant over the discovery. They now have about eight or nine tons of ore on the dump. Their lease runs for 12 months and they have the privilege of purchasing it at a given price if they feel that the showing attained will warrant it.

ORO FINO.—In the Oro Fino district there is but little change in the status of affairs. The Champion is shut down and the minority of the stockholders are dissatisfied with the present management of affairs, as they believe that they have a good mine and one that can be profitably worked. The debt of nearly $60,000 could have been discharged, they believe, if the mill had been kept running. The Oro Fino has cut its ledge at 325 feet and has a ledge of 40 feet at this level and eight feet of good sulphuret ore. The Lion management is booming business, and it is expected that the crosscut which is now being run from the 300 level will strike rich ore in a large body. The Keystone has struck ore at 100, but finds its money gone and the mine attached by operatives. Its stock is non-assessable and the directors are in a quandary. Profiting by the experience of the Keystone Co., the Silver Crown Co. are arranging to change their stock to the assessable form.

NEW MEXICO.

PINOS ALTOS.—Cor. *Southwest Sentinel*, Aug. 26: From Capt. Porter and Charles Anderson, the men in charge, we learned that the Mammoth Co. had a large force of carpenters at work on its new roller-mill, and it would be completed and crushing 80 tons of ore per day 40 days from date. They told us that the perpendicular shaft, the largest in the camp, was down 60 feet, at which depth the miners were working in five feet of ore. Placer diggers are taking advantage of the abundance of water afforded by the heavy rainfalls, and working their locations with great activity. About 30 Mexicans are engaged in the placers and they bring into town nearly $100 each day in gold-dust.

OREGON.

ROBINSONVILLE AND GRANITE.—Baker City *Democrat*, Aug. 26: A visit to the mining districts of Robinsonville and Granite at this time of year would indicate a state of lethargy to the one expecting to see extensive operations going on, but this is entirely owing to the lateness of the season and the shortage of water, thus preventing the many and extensive placers of these districts to be worked to advantage. But inquiry would at once develop the fact that the season of mining just closed has been a most profitable one to mine-owners, the output reaching in excess of former years. In quartz mining, operations are in some instances quite active and development work on the various properties is progressing with most favorable promise, and the future of these camps is highly encouraging. One great drawback to progress is the lack of capital.

GREENHORN DISTRICT. — *East Oregonian*, Aug. 26: Frank Duprat and Andrew Larsen have returned from the Greenhorn mines and report as follows: One of the tunnels on the Cabbelle mine is 936 feet in length, showing up a seven-foot ledge of fine silver quartz. The recent purchasers are preparing to put in a new process for reducing ore, and to conduct developments on a large scale. The Cabbelle is surrounded on the same hill by a number of fine prospects. Passing the Monumental, we stopped at the Buffalo M. Co. A tunnel has been driven 325 feet and another 275 feet. The quartz is hard to work, but a large ledge is being developed. En route to Granite and Robinsonville we find a good many placer mines in operation. The Mitchell mine at Robinsonville is one of the richest in the district. From Robinsonville to Greenhorn camp there are any amount of good claims. The Ruby mine, owned by Collet, Burke & Co. from Salt Lake, has perhaps more developments than any other mine in the district, consisting of open cuts and shafts and a 50-foot tunnel, showing up large bodies of high-grade ore, some samples assaying $1800. Billy Morris is the owner of a fine prospect for which it is said he refused $35,000. Schnarr & Pratt own one of the richest mines in the district. They have a good many tons of high-grade ore on the dump which it would pay to ship, even at the great cost of transportation. The Portland M. Co. have some splendid properties and will in the near future employ a full force of men in the work of developing the Silver King and other mines. W. M. Turner, Ben Durham, Andy Larsen, B. L. Duncan, A. O. Beach, G. T. Fraokum, a company known as the French boys, and Jack Powers & Co., all have good locations and are busy doing assessment for this year. Taylor Althouse, Dr. Boyd, D. B. Thompson, J. Reno, Marcellus and Peter Gagnon, J. Banberger, John Murphy, H. Richardson, I. French, Dart & Co., B. G. Dunning, F. Bernard and others have good claims, and are well satisfied with the returns from the assay office.

UTAH.

REVIEW.—Salt Lake *Tribune*, Aug. 29: The week has been a good one in mining circles. Silver keeps up and lead also, and miners are going into their work with more heart than ever. But more than half the year passed under depression, and that the best part of the year for origioating work, so that the rise in values will not have the marked effect in the production of the year that many have been anticipating. With its drawbacks, however, next year bids fair to be the best in the history of mioing in all this interior region. The receipts of the metals in this city for the week were to the value of $184,874 in total, of which $104,114 was in ore and $80,760 was in bullion. For the previous week the receipts were $241,906, of which $149 309 was in ore and $92,507 was in bullion. The product of the Ontario for the week was of bullion 22,300.45 ounces; ore sales, $14,880.57, an approximate total of $37,181.01. The Horn Silver stock is having another small boom in New York. Nothing new is known of the mine; its average product runs about as heretofore. Bullion receipts in this city for the week were to the value of $25,720; silver bars, $18,000; selected lead, $4540. The product of the Hanauer smelter for the week was $32,500 in bullion. Ore receipts for the week were to the value of $21,778 by Wells, Fargo & Co.; $56,441 by McCornick & Co.; and $25,895 by T. R. Jones & Co.

WASHINGTON.

CONCONULLY.—Okanogan *Outlook*, Aug. 26: A six-inch vein of rich ore was struck in the north drift from the 200-foot level of the Arlington yesterday. The Fourth of July company have decided to continue their double-compartment shaft down to the 500-foot level. The Bunker Hill mine on Palmer mountain has been bonded by California parties. The new buildings at the Lone Star are nearly completed, and development work, which had been suspended for the past month, will soon be commenced again and prosecuted more vigorously than ever. Supt. Webb is pushing things on the Arlington mine. The steam hoist is now in operation, and the work of sinking the double-compartment shaft is progressing rapidly, notwithstanding the hard character of the rock they have to contend with.

Mining Share Market.

The mining share market has been decidedly mixed, but not more so than have been the chipping public. Andes made quite a jump, moving up to over $2 a share, said to be on a short interest. Con. Virginia and Ophir held strong up to Friday, while Savage went down, as did Potosi and the Gold Hill stocks. On Monday and Tuesday the market was dull at shaded prices, with Andes falling off over one dollar a share. At the 2:30 session on Tuesday, Ophir showed more strength, which was followed on Wednesday by stronger prices along the line, closing the day at a decided advance, particularly in Potosi and Bullion. The market acts exceedingly well for a hull movement.

In outside stocks trading has been light. There are reports of dividends by one or more of the Tuscarora companies, which is fully offset by reports of a line of assessments soon.

There do not appear to be any signs of the moneyed public, merchants and the like, buying stock, but all indications go to prove that they are selling when offered an opportunity to do so without netting too much of a loss. It is claimed by those in position to know, in this course they are largely influenced by being disappointed for years past in not getting dividends, but instead assessments. To this disappointment is added the mines are worked in the interest of a limited few. This belief is made stronger by undenied published statements that ore has been taken out of one of the mines (Hale & Norcross) assaying from $50 to over $400 a ton, and when milled only about $20 in bullion is returned, compelling an assessment or two so as to cover expenses. The public reason that if it is done in one mine it is likely to be done in the others. Until the mines are run differently, well-informed persons only look for small deals.

We are in position to affirm that there is a contest for the control of Con. Virginia. As the election is to be held in next month, quiet buying by some Eastern parties has been going on for some time past. What gives additional color to the statement is the fact that the stock is exceedingly scarce with brokers, having been bought by strong parties and withdrawn from the market. An additional evidence is witnessed by the management not paying dividends, although it is said that the company can do so if desired. Not only are there no dividends, but the past week the mine was shut down so as to repair a dam to one of the mills. Heretofore, when the mills are repaired, active prospecting in the mines is carried on.

An effort is being made by a few members of the San Francisco Stock Exchange to have an investigation made of the charges preferred by the Mining Stock Association against the management of the Hale and Norcross mine. The New York *Engineering and Mining Journal* of a recent date says "that on exchange in the United States would allow such charges to be made without a thorough investigation." It is to be hoped that the San Francisco Exchange will not be an exception. If the mine is honestly worked the management ought to court an independent investigation, so as to allay any and all suspicions of dishonesty.

Water-Pipe Manufacture.

We learn from the Sacramento *Record-Union* that there is a strong prospect of a new and important industry being established in that city, that of the manufacture of sheet-iron pipe for conducting water. The enterprising firm which is contemplating this step is that of Schaw, Ingram, Batcher & Co., which recently purchased the extensive hardware business of Helbron & Co. They last week took a contract to supply two and one-half miles of 22-inch pipe for the Golden Feather Channel Co. of Butte county.

In the manufacture of this piping the firm will consume no less than 20 carloads of sheet iron, and the material will soon be on hand and the work commenced. The fulfillment of this contract involves an expenditure of something near $40,000, a large portion of which will be paid out for labor.

The work of carrying out the big contract referred to will serve as the nucleus for a plant to manufacture iron piping, and an enterprise of that character will be permanently maintained by Messrs. Schaw, Ingram, Batcher & Co., in connection with their extensive hardware business.

The work will be done under the supervision of Floyd Taber, who had charge of the manufacture and laying of the water-pipe in the Orangevale Colony near Folsom.

The firm shows commendable enterprise in securing the contract referred to and for its proposed establishment of a permanent factory in Sacramento.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Modoc and Lassen Cos.
T. M. STACKER—Sierra and Plumas Cos.
T. B. LESIEUR—Humboldt Co.
J. W. PURDY—Sonora, Cal.
GEO. WILSON—Sacramento Co.
J. P. QUINETTE—San Francisco.
J. C. HOAG—San Francisco.
SAMUEL CLIFF—San Luis Obispo Co.
W. W. THEOBALDS—Orange and San Diego Cos.
C. J. WADE—San Bernardino Co.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
E. B. TAFT—Clements, Cal.
E. H. SCHAEFFLE—Calaveras Co.
O. N. CADWELL, Carpinteria, Cal.
WM. M. HILLEARY—Oregon.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.
R. G. BAILEY—Washington.
A. S. ROBERTS—The Dalles, Oregon.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUG. 26, 1890.

434,971.—RAILWAY BRAKE—A. F. Baatz, Bellingham, Wash.

435,274.—SOLDERING IRON—F. Barr, Tacoma, Wash.

434,916.—TRANSMITTING POWER—E. Chaffey, Santa Monica, Cal.

435,020.—STREET CAR MOTOR—F. M. Merrill, Oakland, Cal.

435,026.—TROLLING SPOON — H. E. Skinner, S. F.

The following brief list by telegraph, for Sept. 2, will appear more complete on receipt of mail advices:

California—Joe S. Blood, assignor of one-half to F. Manasse, Napa City, knife-sharpener; John M. Bryant of San Francisco, assignor to P. A. Deane, Oakland, ore-crusher; Stephen H. Chase, San Jose, continuous sectional chimney; Ferdinand Frank, Suisun, clothes-drier; George Gates, Drytown, concentrator; Carleton C. Harris, Chicago, Ill., assignor to A. N. Bartlett, Salida, automatic fire-kindler; David B. James, San Francisco, plate or pan lifter; Paul Malsonnsude, Oakland, fruit-stoning machine; Washington Man, Fresno, insecticide; Alfred F. McMillan, assignor to Benicia Agricultural Works, Benicia, gang-plow frames; John L. Notley, Santa Cruz, decorating machine for removing oil or covering from office; Fred H. Smiley, San Jose, journal bearing. Oregon—Joseph Albers, assignor of one-half to J. Zeis, Corvallis, gate; Jennie A. Shepard, tassil-reel for winding skeins of zephyr, etc. Utah—Thomas Delamare, Toole City, axle-skein; Rebecca M. Henshaw, Salt Lake City, clothes-hook.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TROLLING SPOON.—Henry E. Skinner, S. F., assignor to Edward T. Allen. No. 435,026. Dated Aug. 26, 1890. In the manufacture of trolling spoons for fishing it is customary to employ highly polished nickel, silver, or otherwise coated metal, and the hooks are suspended at one end, while the line is connected by a swivel-joint with the opposite end. These spoons naturally become easily tarnished and lose their effectiveness. Iridescent shells have also sometimes been used for this purpose, but they are of an exceedingly brittle and friable nature and have not sufficient strength to form a proper connection between the hooks and the swivel to which the line is attached. In this invention the spoon is made of mother-of-pearl, abalone or other naturally iridescent substance the surface of which does not tarnish. These substances are not naturally strong enough to resist the strain brought upon the line by a heavy fish, and the spoon is therefore strengthened by a reinforcement of metal which is fixed to the spoon. The little bar or band of metal extending across the spoon forms a strong connection between the swivel and the hooks, and it is so small that even if it tarnishes it does not materially affect the use of the spoon, which, being of iridescent shell or material, always retains its bright appearance. Since this spoon was invented by Mr. Skinner it has been adopted by large numbers of expert anglers, who pronounce it very satisfactory in every way.

COMPRESSED AIR STREET-CAR MOTOR.—Frank M. Merrill, Oakland. No. 435,020. Dated Aug. 26, 1890. This invention relates to that class of street-car motors in which the car-frame carries a suitable tank as receiver for compressed air and from which the air is drawn by suitable communications and admitted to the driving cylinders. The invention consists essentially in the provision of a series of communicating cylinders intermediate between the driving cylinders and the compressed-air receiver in which the air is allowed to expand from the excessive degrees of compression which it has in the receiver down to the necessary compression for use in the driving cylinders; and in connection with said expansion cylinders is one or more air-compression cylinders, the pistons of which are operated by power derived from the expansion cylinders—said air-compressing cylinders being peculiarly arranged with respect to the expansion cylinders and adapted to direct what air they compress into the driving cylinders to act in conjunction with the compressed air. The essential object of the invention is to utilize the expansive force of the compressed air which is being necessarily reduced from the high degree of compression in the receiver to the compression adapted for use in the driving cylinders by making said air during this course of operation useful in compressing more air; and another object is to provide against the excessive refrigeration of the parts due to the tremendous expansion which takes place as the air is being reduced from its original compressed state to a state necessary to work the cylinders.

SASH-FASTENER.—Benjamin Marshall, S. F., assignor to the Marshall Improved Window-Furniture Co. No. 433,600. Dated Aug. 5, 1890. This is a novel catch for sash locks. The object of the invention is to provide a simple and effective means for operating any sash lock or catch which employs a detent or pawl adapted to be projected and withdrawn in order to effect the locking and release of the sash.

THE breakage of the South Yuba ditch, Nevada county, caused a failure of water for power and a temporary cessation of work in the Grass Valley mines this week.

MECHANICAL PROGRESS.

The Mannesmann Process.

The Mannesmann process of manufacturing boiler tubes, which was described fully in one of our late issues, appears to be giving the most perfect satisfaction. *Engineering News*, in a late number, furnishes the following interesting facts in regard to the great superiority of these tubes in strength over those heretofore in use:

For the purpose of comparing the ultimate tensile strength of a Mannesmann and lap-welded boiler-tube, two small bottles made of such tubes were filled with boiling water and then placed in a freezing mixture. The lap-welded bottle burst, but the other remained intact.

Another Mannesmann tube, 1 inch in internal diameter and 3 64 inch thick, was subjected to an internal pressure of 3.6 tons per square inch at the Siemens Bros. works at Onalton, without injury. When removed from the testing apparatus it was distinctly warm to the touch, but otherwise exactly the same as before the test. The power of resisting great internal pressure makes the tubes particularly well adapted for vessels made to contain gases at high pressure.

At the Mannesmann works at Komotau, Hungary, more than 600 tons of 3 inch and 4-inch tubes averaging ¼ inch in thickness have been successfully tested to a pressure of 2000 pounds per square inch. These tubes were intended for a high-pressure water-main in a Chilian nitrate district. But the severest test to which the Mannesmann tube can be subjected is the process of manufacture itself. If the metal is homogeneous throughout and well melted, well rolled and carefully heated, it makes a practically perfect tube; but if there is any flaw in the bar, or if the furnace-man has been careless in the heating, then the Mannesmann rolls reject that bar, by refusing to make a tube of it, more surely than a human inspector would do.

This great tensile strength is probably due to the fact that, in addition to being much more worked than most metal, the fibers of the metal run spirally, as has been frequently proved by microscopic examination. The result of this increased strength is a great diminution in the weight of the tubes. While cast-iron tubes will hardly stand more than 200 pounds per square inch, and welded tubes are not safe above 1000 pounds per square inch. the Mannesmann tube easily withstands 2000 pounds per square inch, as already mentioned. The length up to which they can be readily made is shown by the fact that a coil of 3 inch tube 70 feet long was made recently.

Prof. Reuleaux, who undoubtedly ranks as the greatest mechanical engineer in Germany, closed his address thus:

"It is undoubtedly true that we have in the Mannesmann process an epoch-making invention; it is certain to bring about a great change in rolling-mills; it has, indeed, already had a deep influence on rolling processes."

Labor-Saving Machinery and Wages.

Half a century ago, when skilled labor meant hand labor in the fabrication of wool, cotton, leather, wood, iron, copper, lead and the precious metals, there was a superstitious hostility among the laboring classes to the invention and introduction of labor-saving machinery. Steam-power for purposes of transportation drove out of employment thousands of men on rivers, lakes and canals trained to the slower modes of navigation, and other thousands more on land engaged in passenger and freight transportation. The power loom, the cotton gin, the power printing press, the fanning-mill, the threshing machine, the reaping machine, the automatic seed drills, corn-planters, corn-huskers, etc., each in its turn jostled hand labor out of employment and was regarded by the laborer as an interloper and an enemy. Each invention has proven itself a benefactor to the laboring classes as well as to the general public. If there were no other mode of testing results, it could be found in the comparison of wages received now by laborers and those received before the advent of labor-saving machinery. Of the latter period the *Mining Herald* speaks as follows:

Let us compare the wages of those days with the wages of to-day. In 1793 the Schuylkill & Susquehanna Canal Company advertised for workmen, offering $5 a month for the winter months and $6 for summer, with board and lodging. The next year there was a debate in Congress which brought out the fact that soldiers in the regular army were paid $3 a month, and when it was proposed that their pay should be increased to $4, Mr. Wadsworth of this State said: "In the States north of Pennsylvania the wages of the common laborer are not, upon the whole, superior to those of the common soldier."

Matthew Carey, in his "Letters on the Charities of Philadelphia" (1829), gives a painful picture of the working classes at that time. Every avenue of employment was choked with applicants. Men left the city to find work on the canals at from 60 to 75 cents a day, and to encounter the malaria, which laid them low in large numbers. The highest wages paid to women were 25 cents a day, and even women who made clothes for the arsenal were paid by the Government at no higher rate. When the ladies of the city begged for an improvement on this rate, the Secretary hesitated, lest it should disarrange the relations of capital and labor throughout the city. Poor people died in cold and want every winter in the city, and the fact seems to have made an impression only on benevolently disposed persons like Mr. Carey.

The English Iron and Steel Institute.

A very important and unique event in the history of the Iron and Steel Institute of Great Britain will be the manner and place of its next annual meeting. This meeting will take place in the City of New York. The session will commence on Wednesday, October 1st, and will continue three days.

Previous to this meeting, the American Institute of Mining Engineers will hold sessions, also in New York, on the 29th and 30th days of September, to which the English Association is invited.

After the holding of these sessions, there will be an International meeting of the two bodies on the 9th and 10th of October, at which papers will be read by members of both bodies. Among the papers to be read by the English visitors will be one on "The Protection of Iron and Steel Ships Against Foundering from Injury to their Shells, Including the Use of Armor," by Sir N. Barnsby, K. C. B., London; another on "The Recent Development of Marine Engineering," by Mr. A. E. Seaton, Hull.

Sir Lowthian Bell has also been asked to prepare a paper embodying his views on the present state of the iron manufacture.

The program of the New York Institute embraces a list of ten papers.

Several local excursions will take place between the several sessions. After the sessions are closed, an extended excursion has been arranged for which will embrace visits to all the leading iron works and iron-mining localities in the Northwestern and Middle States. The excursionists will go as far west as Lake Superior and south to Washington.

AMERICAN BUILT CARS FOR EUROPE.—The Jackson & Sharp Works at Wilmington, Del., are building passenger-cars for railways in France, Spain and Austria. Mr. William Voss, writing about the cars after a visit to the works, says: They are a curious mixture of European and American practice, and are built according to complete sets of drawings sent over. Of course it is sectional work, like that sent to South America. These cars are about 50 feet long, some of them day coaches and others of the Mann boudoir style of sleeper. They have combination wood and iron sills, bogie trucks, the old-country drawhook and buffers, etc. All the heater and water pipes are of copper, windows run in brass guides (a very good but expensive thing). There is a vestibule at each end, but they do not touch like ours, being about four feet apart when coupled, and iron aprons and railings form the bridge. The entrance is through the vestibule with steps, like ours, but different. The exterior is mahogany, natural-wood finish. Roof much like ours, and is covered with canvas and sheet copper on ends and eaves. Some of the cars have been shipped, six or 12 more are almost done, and a lot of six is just being erected. *Locomotive Builder.*

HEAVY RAILS.—Rails weighing no less than 200 pounds to the yard are in contemplation by the Metropolitan (underground) railway of London. They will be of the bulb-head section, of course. Like other English railways, the Metropolitan finds its third-class traffic enormously increasing, while its first-class is of insignificant proportions. In the past year there was an increase of 21,900 first-class passengers, 68,400 second-class and 584,000 third-class. The latter were carried at an average cost of 1½ cents. The managers think the use of one class of carriages only, with a separate compartment for the aristocracy, will soon become advisable.

ORDERS FOR LOCOMOTIVES.—Among other orders recently received by the Baldwin Locomotive Works are 30 for the Manhattan, 32 for the Union Pacific, 27 for the Northern Pacific, 48 for the Denver & Rio Grande, 12 for the Chicago, Rock Island & Pacific, and 20 for the Baltimore & Ohio. Of the latter, three will be high-speed passenger locomotives with cylinders 20x24, and driving-wheels 78 inches in diameter. Three locomotives for the railroad from Jaffa to Jerusalem, in Palestine, were shipped from those works on July 16th.

STEEL AND WOODEN TIES TO BE CONTESTED. Steel cross-ties have been laid on three-fourths of a mile of the Delaware & Hudson Co.'s track near Saratoga Springs, N. Y., by the Standard Metal Tie and Construction Co. They weigh 90 pounds each, and were laid about 2.6 feet apart, the rails being supported on creosoted blocks placed in a recess in the tie. A parallel track has been laid with new Georgia pine ties, in order to compare the two systems when subjected to equal wear.

A NEW MINING DRILL has just been made which weighs 200 pounds, and which, it is claimed, will bore through the hardest granite at the rate of one inch per minute. It is called an electric percussion drill and delivers a dead-stroke blow at the rate of 300 per minute, with a force of 400 pounds per blow.

SCIENTIFIC PROGRESS.

Germany's New War Rifle.

If one-half of the reports are true, M. Paul Giffard, a Frenchman and an inventor of scientific reputation, has brought out a new and most remarkable improvement in firearms, which, in battle, must prove so destructive of life as to render warfare nothing less than carnage. The inventor has long been so well known by his pneumatic tubs, his "Giffard's injector," so generally used in connection with steam-power, and other important inventions, that any device emanating from his skill and genius would be everywhere considered worthy of the most serious consideration.

The weapon now introduced by him is something more than an ingenious appliance; it is a discovery which not only promises to revolutionize the gunmaker's art, but it is thought will also be applicable as a motive-power. Those who are interested in the Giffard gun claim that it will become the military weapon of the future. The idea of using liquefied carbonic acid gas as a propulsive power is not new, but M. Giffard is the first who has turned it to practical account.

The gun is said to be a model of mechanical simplicity, so simple that it can be readily attached to many of the rifles now in use. It presents but few peculiar characteristics to distinguish it outwardly from an ordinary breech-loader except a long steel cylinder which is screwed under the barrel just in front of the trigger and containing the liquefied gas. In the simple pea-rifles or carbines not adapted to the repeating system the bullet is inserted in a round slot in the upper part of the breech and falls into a small chamber, where it is kept in position by the action of a spring. On pressing the trigger a drop of liquefied gas escapes from the steel cylinder into this chamber, and at the same time the bullet is pushed slightly forward in the bore, so as to receive the full force of the evaporating liquid.

There is no louder report than that produced by the drawing of a champagne cork, no smoke, and no fouling of the barrel. In all these respects M. Giffard's gas gun seems to fulfill the requirements of an ideal weapon for warfare. In some recent experiments in the presence of military experts, when the guns were discharged a rush of vapor was seen issuing from the muzzles, but it instantly faded away and the bullets flew with strict precision to the targets. Barrels which had been repeatedly discharged in the previous two months were shown to have suffered no corrosion. The preparation of the liquefied gas involves no mechanical power, but the needful pressure is got entirely by the chemical manipulation of ordinary substances, such as carbonate of soda—so says London *Engineering*.

There is scarcely any possibility of untimely or dangerous explosion. There is very little or no recoil, so the gun need not have any special weight. It can be discharged over 100 times in a minute.

The gun has already been ordered for the German army. Experiments have given it a range of 3000 yards. The ball penetrates dry deal 32 inches at a distance of 110 yards; at 440 yards, similar wood, 18 inches thick; at 800 yards, 10 inches; at 2000 yards, 2 inches; and at 330 yards, iron plates 7·25 of an inch thick. The depth the shot penetrates into newly thrown up sand amounts, at 110 yards, to about 36 inches; at 440 yards, 20 inches; at 880 yards, 14 inches.

The gas cylinders can be readily filled on the battle-field, and the gun and its equipments will not exceed the weight now ordinarily carried.

The French are also considering the propriety of giving up their cherished Lebel repeaters for this new weapon. The cost of such a gun as would be required for army use would not exceed $5. If what is claimed for it is anywhere near the truth, it must bring about an entire change in military tactics and make war, as already said, nothing but wholesale massacre. It is claimed that in the hands of thoroughly drilled and steady men, every bullet ought to hit within a range of 280 to 380 yards.

The extraordinary qualities of this new rifle make it apparent that even quite stout trees will be no shelter in the future, as the bullet passes right through them, and furthermore, that one bullet can pass through several men, the only consolation left to the soldier being that the hole made is very small.

AFRICA YET MUCH UNKNOWN.—Sir Francis de Winton, late Governor of the Congo State, says in spite of the scores of explorers who have been traversing Africa in all directions since Livingstone began his travels, the larger part of the many millions of natives have never yet seen a white man. As we trace the routes of explorers on the map we see that their tracks make merely a network over Africa, and that there are enormous unvisited spaces between the lines. As yet we can only infer what large regions and the people who live in them are like from the reports of perhaps a single traveler who has hurriedly passed through the country. As an evidence of the much unexplored country that may yet be discovered in that continent, Stanley says that during his recent expedition he came across a new and interesting race, the Wanoumas, who were absolutely European in type and very intelligent. They appeared to be descendants of the ancient Ethiopeans, who settled in some way not known to him in equatorial Africa. These people never intermingled with the aboriginal races, but kept their blood intact, considering the ordinary negroes beneath them. Possibly it was over this race that the beautiful Ethiopean queen of sacred writ once ruled.

A CURIOUS EXPERIMENT.—Several years ago a curious experiment was tried by an English engineer. He took a large funnel fitted with a stop-cock, and screwed the pipe into the top of a boiler containing steam of about 40 pounds pressure. He then filled up the funnel with cold water and opened the stop-cock. It would naturally have been predicted that the steam would have blown all the water out of the funnel. It did nothing of the kind. On the contrary, the water rushed into the boiler. As a result of this and several other experiments, a boiler-feeder was designed and patented, and worked with tolerable success. It was found, however, that it was not certain in its action, and the injector coming into high favor at the time, the inventor spent no more money on his ingenious idea. The inrush of water was due to the fact that the steam condensed in the long pipe of the funnel, and water hammer-action then drove the water into the boiler. Practically, just below the cold water there was a vacuum into which the water was driven by its own weight and pressure of the air.—*Exchange.*

ELECTRICITY IN THE CAR AND SICK-ROOM.—There seems to be a belief among some electricians that some system of utilizing the electric spark for clarifying the atmosphere of railway cars will, in the not distant future, be applied. An electrician the other day said: "A simple and almost perfect method for purifying the atmosphere of crowded apartments, such, for instance, as railway cars, is to produce ozone by electrical sparks, and the practice has been strongly recommended by the highest medical authorities. The delightful freshness and vigor which is perceptible in the air after a series of sparks from an ordinary influence machine, is a proof of the salutary and refreshing influence produced." In connection with the above it may be remarked that a physician in Philadelphia has taken a very wise step in the introduction of a small electric machine for the production of ozone. It is in a compact form, operated by a small battery, and can be conveniently carried. There is said to be a large demand for the machine for purifying the sick-rooms of private patients.

A SNOWSTORM ON MARS.—Prof. Pickering has of late been making very close observations of the planet Mars. He took 14 photographs of that planet on the 6th and 7th of April last at about equal intervals of time apart, in regard to which he made, in substance, the following announcement: The white spot covering the south pole is plainly visible on all the negatives, but was conspicuously larger on the negatives taken near the close of the second day than on the earlier ones. The natural inference is that during those two days a large amount of snow must have fallen in the neighborhood of the south pole, covering that portion of the surface of the planet to so much greater extent that the increased area of the white spot was noticeably pictured upon the negatives; and we thus have information of a great snowstorm on the southern hemisphere of Mars.

THE HUMAN TOE AND MOUTH.—In the anatomical institute at Strasburg, it has been found that the small toe of the human race is retrograding and losing one of its joints. Among 50 small toes dissected, 14 had two joints instead of three. The Springfield *Union*, under the head of "Will the month ever bite the ear?" says: A Frenchman has discovered that the human mouth is gradually working its way around toward the left ear, and accounts for it by the invariable tendency of men to eat chiefly with the teeth on the left side of the mouth. This wears out the teeth on that side and gives the jaw a cant toward the left. In the course of a few ages it is believed that the mouth will approach the left ear, and there is some danger, if the process keeps on long enough, that it may get around to the back of the neck.

A NEW METHOD OF PRODUCING ELECTRICITY. The accomplishment of a hitherto apparently impossible feat—the useful transmission of mechanical work directly into electricity—is claimed by Prof. Braun of Tubingen. He winds nickel wire into spirals, and as each spiral is elongated or compressed a current of considerable strength is generated. This is increased by putting a number of spirals in parallel. Such positive results are stated to have been attained that the professor is hopeful of being able to construct a practical generator on this principle.

PHOTOGRAPHING AN OIL WELL.—An experiment was made in photographing the bottom of an oil well recently at Warren, Iowa. The instrument was let down a distance of 1700 feet. The moment it touched the bottom a bright flash lit up the cavity, and a perfect picture of the whole was impressed on the negative. It revealed, as the effect of the explosive shock, a cavity of 14 feet broad and 7 feet below sand. Rock, sand, pebbles and minute objects were distinctly revealed upon the plate.

Useful Information.

Damage from Lead in English Lace.—Ph. De Carmont gives an account in *Le Moniteur de la Teinture*, of a white satin dress totally ruined by its trimming with English lace. The dress had been worn but once, had then been packed into a trunk which was deposited in a damp place and exposed to emanations of hydrosniphuric acid from gas. When taken out, it was found that the pattern of the lace, particularly of its tulle ground, had been printed in indelible black upon the white satin. The accident was not difficult to explain. English laces is habitually charged with sulphate of lead, which in this case had absorbed hydrogen and hydrosulphuric acid from the atmosphere, forming sulohide of lead, which had been imprinted and fixed upon the white satin, which naturally had also absorbed hydrogon and hydrosnlphuric acid. The seller of the lace showed that charging English lace with white lead (sulphate of lead) was commercial usage, and thereby escaped paying the damage. An objectionable usage it is at any rate, as the absorption of lead through the skin from such lace may become dangerous to health.

Ocean Timber Rafts a Success.—The steam schooner Noyo, from Noyo, lately arrived at this port with a raft of 500 and odd piles in tow. They were consigned to the Southern Pacific Railroad Co, and are intended for the repair and construction of bridges on its lines. This is the sixth trip with rafts of the Noyo, and each of its voyages has turned out successfully, so says the *Pacific Lumberman*. The rafts are constructed one deep. They are made of lots of 30 piles each. The piles are bored through, and a chain passed around the lot. Each lot in its turn is attached to the main chain by which they are towed. The great Leary raft has also been safely moored in New York harbor, and it has been practically demonstrated that this means of transportation is feasible, yet it is hardly to be recommended from its attendant dangers to our shipping interests. Icebergs are bad enough, but are hardly less to be dreaded than would be such a raft if left floating about in the open sea.

A New Gas Detector.—Spongy platinum, as is well known, glows in a mixture of combustible gas and air; but hitherto no convenient arrangement has been devised for utilizing this reaction. H. N. Warren proposes to saturate asbestos yarn with a saturated solution of platinum oxalate, and then ignite it in a platinum crucible. This prepared yarn when heated to 80° F. becomes incandescent in an atmosphere containing 0.5 per cent of coal gas by volume, and by arranging it by the side of the wick of an ordinary spirit lamp, it is easy, by lighting for a short time, to raise the temperature of the yarn to the requisite degree, so that when the lamp is blown out it will become incandescent if there is any escape of coal gas in the neighborhood.

Shears and Scissors.—For a long time the difference between scissors and shears was determined by the former having two sharp points, and the latter one. This difference has gradually lost its determining technicality, and the shears of to-day are called so because one of the bows has room for three fingers. It is not always so, but shears are generally longer and of heavier weight than scissors, as would be implied by the necessity of the strength of using three fingers in the leverage. The cutting of stronger textures has led to a difference in the manufacture and general form of these articles of cutlery, but what determines the name is the fact of using three fingers or less than that number in one of the bows.

A New Motor Agent.—M. Giffard, the inventor of the "gas gun," noticed at length in another column on this page, is now engaged in discovering a means of adapting his system to machinery of all kinds, so that one of these days not only the steam locomotive but even the electric motor may possibly be supplanted by a Giffard liquefied-gas engine. Although the latter prophecy must be taken with the proverbial grain of salt, still the well-known character of M. Giffard, as a scientific inventor, gives good reason to hope for something as practical in the way of a motor, by his system, as we have already seen accomplished by him in gunnery.

What is Invention?—The late Judge Hall of the Circuit Court of the United States said: "An invention, in the sense of the Patent law, means the finding out, the contriving, the creating, of something which did not exist and was not known before, and which can be made useful and advantageous in the pursuits of life, or which can add to the enjoyment of mankind. In other words, the thing patented must be new; and it must be useful to an appreciable extent, though the measure of that usefulness is not material. Any degree of utility appreciable by a jury is sufficient, upon the question of utility, to sustain a patent."

Solid Petroleum.—That the commercial practicability of solidifying petroleum, upon which doubt was cast some time ago, is established, is proved by the exhibition of Prof. Millefleurs before a meeting of Parisian scientists, of several bricks of petroleum which he has produced by an original process. The bricks were hard enough to be handled without inconvenience, yet soft enough to be cut with a stout knife. They burned slowly when touched with a lighted match. Prof. Millefleurs claims that they are non-explosive and inexpensive.

Trusts and Prices.—The trust idea in business operations is unique and catching, and is by no means confined to this country. It now appears that a syndicate of French dry-goods merchants in Mexico has bought up the entire output of the cotton-print mills of that country until January next and raised the price 30 per cent.

A Fine Odor for Rooms.—If you want a lovely odor in your rooms, break off branches of the Norway spruce and arrange them in a large jug well filled with water. In a few days tender, pale-green branches feather out, soft and cool to the touch, giving the delightful healthy-giving odor.

During the heated spell a few days ago, workmen removed a street-car rail at Reading, Pa., and it expanded so much that it could not be put back in its place.

A Patentee is protected from the use of all plans or devices which, however seemingly different from the patented invention, are the same in principle and operation.

Rubbing with salt and vinegar brightens brasswork.

Good Health.

Deaths Under Five Years.—The following facts, which we quote on good authority, certainly show the necessity for sanitary missionary work as a life-saving means in the principal civilized nations of the globe: "In Norway the proportion of children dying under five years of age is 204 5 per 1000 born, while in England it is 330 per 1000, and in Italy it is 567 per 1000. In 51 so-called 'healthy districts' of England and Wales, the mortality under five is 175 per 1000 born, while in the Liverpool district, representing the most unfavorable sanitary conditions, it is 460 per 1000. In the State of Vermont, which contains no large cities, the number of deaths under five, for the year 1883, was 23.8 per cent of the whole number of deaths; in the State of Massachusetts, in which there are several large cities, for the 12 years ending in 1884, it was 34 74 per cent, and in the city of New York alone, for the seven years ending in 1873, it was exactly 50 per cent of the entire mortality."

Resuscitation of the Drowned.—Dr. Clark, in advising young physicians, urges them in cases of death by drowning not to fail to use electricity in their efforts to resuscitate. He says that a fine point of differentiation as to the probability of resuscitation in a case of drowning is whether it was suicidal or accidental; for a suicide cannot be saved after five minutes of submergence, but the accidentally drowned may be submerged 20 and possibly 30 minutes, and yet be resuscitated. The horror and revulsion of feeling and the fear of death of the latter are not present in the former, and this influence on the mechanism of the heart may account for the difference. "Persevere in your efforts, as life has been restored in drowning cases after four hours' work."

Relation of the Left Hand to Health.—In connection with the subject of the duality of the brain, there is one point of great importance about which I can only say a few words. It is that we have a great many motor elements in our brain and our spinal cord, which we neglect absolutely to educate. Such is the case particularly with the elements which serve the movements of the left hand. Perhaps, however, fathers and mothers will be more ready to develop the natural powers of the left hand of their children, giving them thereby two powerful hands, if they accept that, as I believe, the health of the brain and spinal cord would improve if all their motor elements were fully exercised.—*Dr. Brown Sequard.*

Ingrowing Toe-Nails.—A correspondent of the *Scientific American* writes as follows: In a recent number of your valuable paper I noticed that an inquirer was advised for the cure of an ingrowing toe-nail to slit the center of the nail. I think a much better way is to thin the surface of the whole "top" of the nail with glass paper (sand paper), say No. 2, or finer, as best suits the case; keeping the nail short in the center, allow the corners to grow till they are a little beyond the flesh; place a little double of cotton cloth between the sore place and the edge of the nail. All this being done, the relief is immediate and the cure certain.

Doctors and Population — France has 38,000,000 population, 11,995 doctors, while it graduates 924 medical students in one year. Germany has 45,000,000 population, about 30,000 doctors, and graduates 925 students in one year. The United States has about 60,000,000 population, nearly 100,000 doctors, 13,091 medical students, and graduated 3740 students in one year.

The Writer's Cramp.—A stenographer says: "People often ask me when I sit down to do a long job of shorthand why I lay before me so many pencils of different sizes. My reason for it is that by picking up pencils of different sizes, and consequently weights, I am enabled to rest my hands while continuing to work. Each different pencil brings into active play different muscles, and I never suffer from cramps, as might be the case if I used but one size pencil. A horse going over an ordinary turnpike, up hill and down, will be in better condition at the end of a day than a horse which has traveled the same number of miles on a racetrack."

Electricity.

Electrical Progress.

There has been an enormous progress made in electrical industry within the last ten years. So rapidly and to such an extent has it already grown that the mere figures of its progress are utterly bewildering. There are now over $600,000,000 invested in electrical industries, and employment is thereby directly given to over 250,000 people, to say nothing of the indirect advantage which it extends to probably as many more. We have in the United States 1,000,000 miles of electric wire in operation; over 300,000 telephones; 400 miles of electric railroads; over 3,000,000 electric lamps, and the industry is now growing faster than ever before. At the same time the cost of electricity and all its appliances is constantly being reduced.

So profitable is the industry that the mechanical and inventive genius of the country is being centered more upon the business than upon electrical research. The fatalities which have occurred from imperfect appliances and from the inexperience of people in regard to its character, both as employes and as "outsiders," has no doubt had a tendency to check, somewhat, the progress of the industry; but still it goes on increasing in proportion and widening in application. And it will thus progress, and people must learn to keep out of its way; while all reasonable precaution should be taken by individuals and governing bodies to reduce the danger to its minimum.

Application of Electricity to Cross-Country Railroads.

Considerable discussion is going on just now over the problems connected with the application of electricity to locomotive service outside of city and town limits. It has already proven a success on street railways of from five to six miles extent; in several instances this distance has been increased to a service of 10 and even 15 miles, with a proportionately large number of cars moving at the same time.

Not only are electrical engineers considering the question of extending it to suburban railways generally, but the railroad journals of the country are freely discussing the question, which but a short time ago they regarded as purely chimerical. The outlook in this direction is growing more and more promising every day.

The New York *Evening Post*, in alluding to this more extended application of electricity, says: "One of the main objections to the electric locomotive seems to be its increased cost as compared with the steam locomotive. An electric machine at the rate of $20 per horse-power costs twice as much as a steam locomotive of equal capacity. This may be true, but it is to be borne in mind that these are still early days for the electric motor, and that the near future promises considerable reduction in the price of such apparatus, especially as it grows into a larger size. But this argument of cost is especially offset by the fact that the electric system promises, and so far has secured, superior economy in the reduction of running expenses for fuel and other purposes. In the case of the horse roads, for instance, the cost of animal-power is twice that of electric-power, since, in the case of electricity versus steam, the current would be generated by means of stationary engines of the most economical type as compared with locomotives, which 'eat as they go,' and naturally use fuel to a degree that leaves a large margin for daily saving.

"The other considerations in favor of the electric locomotive are that millions of dollars of property are annually destroyed by sparks from passing locomotives, and in a great many States the smoke and soot from the soft coal is very much of a nuisance. All this, of course, is absent from the electric locomotive, which, while not absolutely silent, gives no other additional sign of its presence and activity save an occasional harmless flashing at its points of contact. The motion with the electric locomotive is also extremely smooth and steady, and one can look out of the car windows without fear of being blinded and blackened with coal grit."

Electric Power.—The utilization and distribution of electric power are stated by Mr. F. L. Pope to have reached by far the greatest development in Switzerland and the United States. In the former country electricity is transmitted to considerable distances for large motors. At Solothurn a manufactory of machine screws is driven by an electric motor of 50-horse power, which derives its energy from a turbine-wheel more than five miles away. At Derendingen a mill of 36,000 spindles is driven by a pair of electric motors of 280-horse power, operated by a turbine-wheel 12 miles distant. It is predicted that in cities electric motors will soon practically supplant steam engines of less than 50-horse power.

Engineering Notes.

The Coming Street-Car.—What pattern of car shall we plan to build in the near future? This question has been asked us recently by car builders. Will the present style of electric and cable-cars continue to be used, or may we look for a radical change before long? There is no doubt that the development of the street railway business during the next few years is to be greater than has yet been thought possible, and the present style of car will continue to be used for a time at least, but there is a growing tendency to the use of long six or eight-wheel cars. We incline to the belief, however, that a change will occur, and the more general practice will be to operate mechanically propelled lines with short dummy-cars or locomotives, which will tow cars of ordinary build and operate in about the same space as now required for a team of horses. The advantages of such a practice are that the system is more elastic and can more readily provide for the fluctuation of traffic, and when the motor is in for repairs the passenger rolling-stock is not idle. Of course, such a system supposes that there will be better safety appliances than are now provided, either by vestibuling the platforms or providing such gates and guards as will compel the passengers to be careful. If the question was intended to call out our opinion as to the probability of providing a universal motive-power for street cars, we answer that the indications are that the field will continue to be occupied with a great variety of motors, but that there may be a very uniform pattern of tow-cars. These, however, will be more expensively constructed, for there is an increasing demand on the part of patrons for more ornamentation and greater comfort.—*Street Railway Journal.*

Notable Application of Power.—Some very interesting features are noted in the power equipment of the Treadwell mill, Alaska—the largest quartz-mill in the world, consisting of 240 stamps, 96 concentrators, 12 ore-crushers, etc., and requiring about 500-horse power. All of this machinery, covering several acres of ground, with its vast complication of counter-shafts and connections, is run by a single wheel seven feet in diameter, operating under a head of 490 feet, making 235 revolutions and using 630 cubic feet of water per minute, this being discharged through a nozzle 3 31 inches in diameter; with a 4-inch nozzle this wheel will work up to 735-horse power. Perfect regulation is afforded by the use of a deflecting nozzle operated by a hydraulic governor; the nozzle is about four feet long with a ball joint at the butt end, and to the discharge end is attached by lever connections an automatic hydraulic regulator, which varies the amount of water applied to the wheel as may be needed to adapt it to varying loads—a device which affords a peculiarly simple, sensitive and satisfactory regulation. With such an arrangement, and in such a location, the advantage of water-power is conspicuous. Thus the wheel above mentioned weighs but 800 pounds, and the entire equipment, embracing shafts, boxes, driving pulley, etc., only about 4000 pounds; on the other hand, a steam machinery plant, to give the maximum capacity of such a wheel, would not weigh less than 200 tons, and the expense of running such a plant would be almost immeasurably greater.

How Fast Can a Locomotive Run?—It seems to be quite clear that if steam enough could be supplied to a locomotive engine any speed could be attained, unless the resistance to its progress augmented in such a proportion that the boiler-pressure was not great enough to overcome it. The engine would then be, to use a marine phrase, "looked up." We know that at a velocity of as much as 72 miles an hour on a level a well-designed single-driver light engine will run with the throttle but little open, and apparently exerting very little power indeed. It is not easy to see why an addition of eight miles an hour should pile up the resistance as it is said to do. The question seems, however, to bristle with anomalies and contradictions of the most vexatious and puzzling character, and we are at times tempted to believe that these difficulties have no existence—in fact are for the most part the creation of fancy.—*Engineer.*

The English Channel.—The latest project for bridging the English channel has progressed as far as the formation of a company to obtain concessions in France and England, the drawing of plans and the making of soundings. The French Government will doubtless favor the enterprise, but whether a majority of the English statesmen can overcome their fear of invasion by France, even by the latest method proposed, is still a question. This project consists of a contrivance having a central point of tunnel termination at some distance from either shore and connected by a perpendicular shaft with a short section of bridge to be built out from the land. The great advantage of such a passage would be the difficulty of its successful use by the belligerent French in an attempt to capture Great Britain, as the bridge end could be destroyed.

The Proposed Submarine Tunnel between Staten Island and Long Island seems to be making good progress. A company has been incorporated and a route surveyed for the connecting road.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

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Entered at S. F. Post Office as second-class mail matter

SAN FRANCISCO:

Saturday, September 6, 1890.

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[NEW THIS ISSUE.]

Typewriters—Leo E. Alexander & Co.

Dividend Notice—Pacific Borax, Salt & Soda Co.

See Advertising Columns.

Passing Events.

San Francisco is getting ready for the celebration of the 40th Anniversary of the Admission of California into the Union. The streets and buildings are being decorated, and everywhere are signs of preparation for the coming holidays. It is expected that the procession will be the largest ever seen in this city, and that there will be a larger representation from the interior of the State than ever before.

The topic of interest in mining circles is the affair of the Mining Stock Association and the Hale and Norcross M. Co., in which an attempt will be made to bring to light the details connected with the milling of Comstock ores by the company.

The Labor Day parade, which occurred on Monday, was an orderly and well-conducted one which somewhat surprised the citizens by its magnitude. The labor organizations of the city made an excellent showing.

THE GAS WELL AT SUMMERLAND.—Mr. S. P. Snow writes us as follows from Santa Barbara: "The great wonder of California, the gas well at Summerland, still holds out to burn, and the supply of gas is, I believe, increasing. It is the hope of many that it will revolutionize the industrial situation of Santa Barbara. The wood-chopper say people are afraid to buy a load of wood for fear they will have a few sticks left when the gas lights and heats every house in the city."

Mining-Stock Mining.

A local daily newspaper, which pays considerable attention to the kind of mining (?) done on Pine street, in this city, says: "The operations of a few malcontents on the street threaten disaster to the welfare of dealers who have their capital, large and small, locked up in the Comstock mines. The disaffection is not contagious, and the pecuniary prospects of the few who may be engaged in the present warfare against the managers of the mines, who control the destinies of the market, is of little importance to the great majority of investors, who care more about a lively turn in a stock than they do for dividends."

This caring more about a lively turn in stock rather than for dividends is the very thing that has brought the mining-stock business into disrepute and reduced it to its present status in San Francisco. In former years there were 20 who bought mining stock to one who buys now; the value of the shares was far beyond the present prices, and the volume of transactions was a hundred-fold that of the present. San Francisco held first place of all cities in the matter of mining investment and San Francisco companies were looked upon as the best to take hold of a camp.

The past ten years have wrought a great change in all this. We have an unenviable reputation of speculating in stocks rather than working mines, and people who have mines to sell and open prefer Denver, Chicago, St. Louis, New York or Salt Lake men to take hold of them.

How much of this change is due to our preference for "a lively turn in the stock market rather than dividends," it is impossible to say, of course; but it is certain that the more we have neglected mines and fostered stocks, the less has been our influence in the mining industry.

The original idea of mining companies with shares of stock was to develop mines by the sales of stocks, the value of which varied with the value of the mine; but this idea has practically been lost sight of. It is notorious that the ups and downs in prices of stock are due more to the manipulations of the managers and brokers than to the conditions of the mine. By these machinations the order is reversed, and the better the mine, the more the price of the stock is forced down—for a time—and vice versa. It is notorious, too, that dozens and dozens of mines have been dealt in for years which never had the slightest chance to pay dividends.

As far as the mine itself is concerned, if it cannot be made to pay from its ore, it is made to pay from its stock; and those that pay certain people from the stock transactions seem to be the favorites with those who manage our stock markets for us. The moment some man attempts to put affairs on a proper basis there is indignation expressed by those interested about "disaster" to the welfare of those who have capital invested.

The truth is that it is not those who have capital invested who make money out of these stock mines. It is others who obtain the management and who take mighty good care that they pay very small shares of the assessments.

There is nothing new in all this, of course. The facts are perfectly well known and appreciated; but to all men who believe in the legitimate mining industry being fostered, it is very discouraging that such a state of affairs should last so long. Other States are making much more rapid strides in mining than California and Nevada; yet these other States pay much attention to mining and very little to stocks. There are very few California mines called on the Boards, and not one that amounts to anything as a real mine; and Nevada mines that could pay legitimately under other conditions are placed in positions where they are looked upon with suspicion, to the detriment of the whole industry.

If there is any possible way to remedy this existing condition of affairs and put the money from the mines into the pockets where it rightfully belongs; to place the mines on a more substantial basis as legitimate objects of investment; to change mere hourly speculations on paper into a business carried on for dividends, let us hope it will soon be tried.

ACADEMY OF SCIENCES.—At the last meeting of the academy, Dr. H. H. Behr read a paper on "The Caprification of the Fig," and F. J. Walker read one on "The Location and Area of the Big Tree Forests of California." A copy of this paper was ordered to be sent to the Secretary of the Interior. An obituary on the late Adley Hook Cummins was read by S. W. Holliday. One hundred and forty-six new books were reported, among them a very valuable set of 25 volumes of the "Zoological Record," donated by Prosper Huerne.

Mineral Lands and Railroads.

The Secretary of the Interior has decided the case of the Central Pacific Railroad against S. D. Valentine, involving the question of the exception of mineral lands from railroad grants. The particular tract involved is in the Sacramento (in this State) Land District. The Secretary holds that by the terms of the railroad grant all "mineral lands" are excepted from its operation, whether known to be general in character at the date when the railroad company's rights attached under the grant or not, if they are discovered to be mineral lands at any time before the issuance of the patent to the company, or certification where the patent is not required. He also holds the discovery of the mineral character of the lands after the company's rights have attached to its granted lands proves such lands were mineral in character at the date when the company's rights attached, and were, therefore, within the terms of exception from the grant.

This is a most important decision for the mining industry of this State, and is in keeping with that recently made by the U. S. District Court in the case of Francoeur vs. Newhouse. With both the departments and the courts favoring the miner, it is not likely there will be any reversal.

The decision is a common-sense one, which is more than can be said of many of the rulings which are apt to be based rather on technicalities than abstract justice. The last sentence quoted above is a view of the subject which will be distasteful to the railroad companies that have Government grants, but is a proper view nevertheless. It was never the intention of the Government to give the railroads any mineral land, for that was reserved for the prospector and miner.

In this and other States we have seen people buying titles to mineral ground from the railroad companies, when by rights the companies never owned it. In Montana, the miners are "up in arms" on the subject and are making a strong fight for their rights. The recent decision and ruling will do much to help their cause and defeat the attempt of the railroad companies to take possession of a magnificent mineral domain.

The Labor Day Parade.

The celebration of Labor Day in this city was carried out in a manner that was rather a surprise to many citizens. There were some 7000 wage-workers marching in the parade, and the city has never seen a more orderly demonstration or one that created a more favorable impression. The men were quiet, well-behaved and well dressed, showing themselves to be in good circumstances. The observer of the parade was struck with the thought that there seemed to be perfect organization in the ranks, and that each separate organization was but part of a grand whole.

Those who had an idea that organized workingmen formed a sort of lawless band must have had this dispelled when seeing this orderly and intelligent-looking body of men. The thousands of people who lined the sidewalks and streets were in harmony with those in the procession, and everything passed off without anything to mar the effect of the occasion.

Although there have been several parades on Labor Days, this was virtually the first time that the organized artisans of San Francisco ever showed their full combined strength. Nearly all branches of labor were represented. There were no gay uniforms glittering with gilt and tinsel, but simply a body of earnest working-people marching through the streets of the city in which they earn their bread. Yet they made a very decided and favorable impression on those who saw them, and it is pretty certain that their demonstration dispelled certain prevalent erroneous ideas concerning them, both as individuals and as to their aims and objects.

Hanging Up Stamps.

Isaac K. Cleaver of Deadwood, Trinity county, this State, has just received through the MINING AND SCIENTIFIC PRESS Patent Agency a patent for a hanging-up attachment for stamp batteries, the attachment being of such a kind that it will tend to grip the stem tighter according to the effort due to the weight of the stamp itself and jarring of the operating stamps to work the stem loose. Moreover, the hung-up stamp stem can be turned to any convenient position in which to carry out the purpose for which it is hung up.

A fixed bracket is supported by the frame of the battery and encircles the stamp-stem, the stem playing freely up and down through it. Between the ends of the brackets are eye-bolts, and upon these are pivoted opposing cam-shaped gripping-jaws. These jaws have straight faces in their inoperative position and curved or cam-faces for their gripping position. The ends of the jaws project outward from the bracket-ends, and to them are connected the lower ends of lifting chains. These chains at their upper ends join or connect with a swivel-ring to which any suitable hoisting mechanism may be connected.

When the stamp is operating, the jaws lie straight and the stem plays up and down between their straight faces, but to hang up the stamp the swivel-ring is hoisted and through the lifting chains the jaws are so swung that their curved gripping faces come down against and bind on the stem on each side, and as long as the tension is kept on the chains the jaws grip and hold the stems. Being cams, by reason of their position and curved faces they tighten on the stem the harder as the latter tends to pass down between them. Therefore, no matter how great may be the jar of the operating stamps, the particular stamp hung up will not be loosened, but on the contrary will be tightened and by reason of the swivel-ring the hung-up stem may be turned to the most convenient position for working. The inventor is sure there can be no slipping of the stem in the use of this attachment.

THE ANTI-DEBRIS ASSOCIATION.—The regular annual meeting of the Anti-Debris Association of the Sacramento Valley took place last week in Yuba City, the president, Dr. C. E. Stone, being in the chair. The report of the president was read, reciting the history of the operation of the association during the past year, and recommending that as the counties of Yolo, Colusa and Sacramento will soon join Yuba and Sutter in their efforts to put an end to destructive mining, arrangements be made to give these counties a representation upon the Board of Directors of the association. The report of the manager, George Ohleyer, was then read, and also a statement of the present status of hydraulic litigation. The secretary was ordered to cast the ballot of the association for the present directors, as follows: B. F. Walton, T. B. Hull, G. W. Hutchins and P. C. Slattery. G. W. Carpenter was elected treasurer.

A CARSON river mill superintendent says that if the snowfall next winter is one-half the average of last, there will be enough accumulated in the mountains, with that left from last winter's fall, to keep all of the river-mills in full operation throughout next year, and he predicts that the bullion product of Comstock mines in 1891 will exceed that of 1887.

THE Union Iron Works promised the firemen and machinists $20 bonus each for every knot the Cruiser San Francisco made over 19 knots on her trial. She did not make one knot over the 19 required, but the men were paid for three-quarters of a knot, or $15 each.

RICHARD DAY ATKINS, the well-known mining capitalist, died at Nelson, B. C., last week. He moved to Montana 25 years ago, and later made a fortune in the diamond mines at Kimberley, South Africa. Mr. Atkins was in San Francisco a few weeks ago.

ONE HUNDRED non-union miners imported by the Dunsmuirs are expected from England next week to take the places of the strikers in the Wellington collieries.

THE earnings of the Comstock Tunnel Company from October, 1889, to July 1, 1890, according to an official statement, aggregated $220,911.

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San Bernardino County.

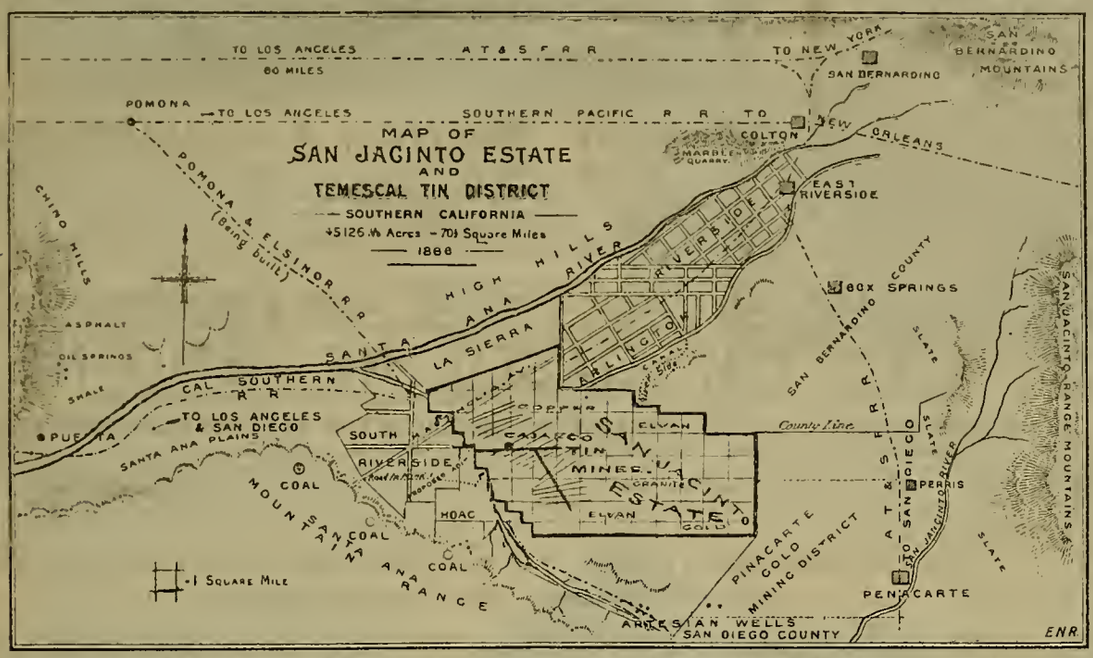
Its Mineral and Other Resources.

NUMBER IX.

[Written for the PRESS by JAMES H. CROSSMAN.]

Temescal Tin District.

On entering this county from San Francisco via Los Angeles, the first mining district that is called to the writer's attention is that of the Temescal tin district. It is situated on the southwest portion of the Rancho Sobrante de San Jacinto, a Mexican grant. The San Jacinto estate now comprises an area of 45,126 acres, or 70½ square miles. The tin district proper has a superficial measurement of 23 square miles, or 11 miles in length S. E. and N. W. by two miles in width. It is situated 55 miles easterly from Los Angeles.



MAP OF SAN JACINTO ESTATE AND TEMESCAL TIN DISTRICT, SAN BERNARDINO COUNTY.

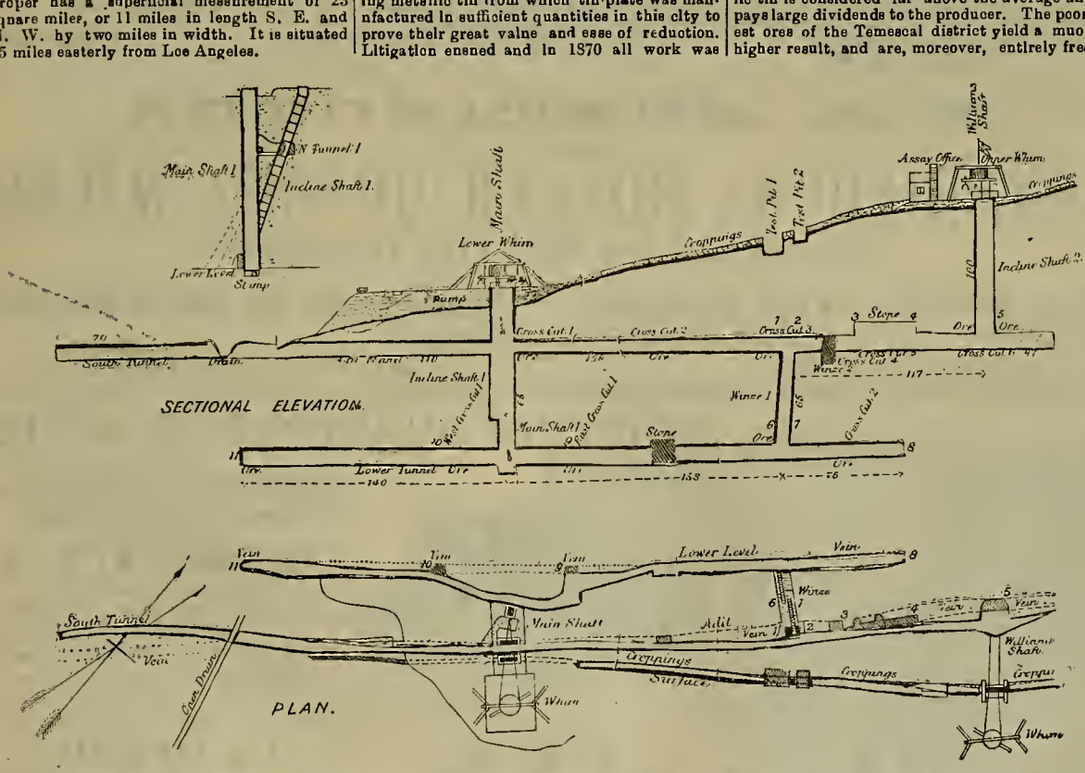
The district contains numerous metalliferous veins carrying ores of tin, copper, gold and silver in paying quantities. Tin being the predominating metal, I will first describe the formation and occurrence of its ores.

San Bernardino county is the only known locality on the Pacific Coast that contains ores in place of this valuable metal. Its domain is in the Temescal range of mountains and its zone proper is bounded on the north by the Santa Ana river and valley; on the south by Temescal creek, which separates it from the Santa Ana range; westerly by the Santa Ana plains and easterly by the San Jacinto river. This includes an area of 12 miles in length S. E. to N. W. and four miles in width, in which occur over 60 known and well-defined veins of tin-stone. These vary in width from four to six feet, and some of them carry ores of a high grade in the form of tin oxides (cassiterite). These veins, in the aggregate, extend on their line of strike 35 miles. The ores of these mines are remarkably free from any base that prevents their easy reduction and concentration or that debases the metallic product. The average yield is 15 per cent of black metal, which will return over 66⅔ per cent of pig tin from the furnace. The principal, and in fact the only well-developed mine in the district at present, is the

Cajalco Mine.

This was first exploited in 1868. Its ores for a test were reduced on a small scale, yielding metallic tin from which tin-plate was manufactured in sufficient quantities in this city to prove their great value and ease of reduction. Litigation ensued and in 1870 all work was suspended, which state of affairs continued until March, 1888, when the title was confirmed on an appeal, the Supreme Court of the United States settling for all time the validity of the title in the present company. During this lapse of time the public had forgotten the existence of this valuable deposit and ceased to wonder why it was not being worked, and at date very few realize that we have in our State a "treasure trove" that will soon fill a much-needed want. Last year our importations from England amounted to over 430,000 tons of tin-plate, equaling over 5,500,000 boxes of tin and terne plate, upon which a duty in excess of $5,500,000 was collected by the United States, to say nothing of the first cost of the material. The Pacific Coast alone consumes 30,000 tons per year in canning industries. The imports of pig tin into the United States last year were 20,000 tons.

There can be no question but that the mines of Temescal district can, when in active operation, supply the demand and support an army of operatives. Tin will be produced and extensive tin-plate manufactories will soon probably be erected at some central point accessible to trade centers. The extraordinary high grade of the ores of the Temescal veins, compared with tin ores that have for so many hundred years been worked profitably in Cornwall, renders it an assured fact that work of development will soon be profitably inaugurated. In Cornwall, ore that only yields 2½ per cent metallic tin is considered far above the average and pays large dividends to the producer. The poorest ores of the Temescal district yield a much higher result, and are, moreover, entirely free from the bases that deteriorate the Cornish ores. I confidently predict that the day is not far distant when San Bernardino will be to the United States what Cornwall is to Great Britain.



PLAN AND SECTION OF THE CAJALCO MINE, TEMESCAL TIN DISTRICT, SAN JACINTO ESTATE, CALIFORNIA.

The axis of the mountain range that lies east of Temescal creek, in which the tin-bearing zone occurs, is a secondary granite. It rises to an elevation of from 500 to 700 feet above the bed of the creek and 1280 feet above the level of the sea. Its granitic central core (which is four miles in width) is flanked on either side by belts of a hard dark-colored porphyry about 1¼ miles wide, which changes in both texture and color as it approaches the metal-bearing (granite) material. The colors vary from gray to white, and when in near proximity to the granite, assume a rose-red tinge. This discoloration is probably owing to iron or some other metallic oxide. This rock is technically designated by the Cornish tin miners as an elvan course, composed of quartziferous porphyry, which invariably skirts and accompanies the peculiar granitic formation that incloses the tin-bearing lodes. The granite of this district is identically the same, both in crystallization and mineral contents, as that in which the tin mines of Cornwall occur. The belt on its southeasterly course intersects the coal, asphaltum and oil bearing slates and shales of the Santa Ana range, and disappears—a notable feature.

The tin-bearing lodes are strictly confined to this granitoid rock, while the adjoining elvan courses and porphyritic rocks are seamed and fissured with veins carrying metals of copper, gold and silver, with occasionally a small percentage of tin. In this mineral zone are found more than 60 tin-bearing veins lying parallel with each other, coursing at nearly a right angle with the strike of the granitic belt. These veins in the aggregate represent an extended length of tin-bearing lodes of not less than 35 miles, coursing northeast and southwest, while the trend of the granitic and porphyritic belt is southeast and northwest, proving beyond controversy their character as *true fissure* veins, which in all probability go to the deep. They dip northwesterly at an angle of 65 degrees from the plane of the horizon.

The Tin-Bearing Lodes Proper

Of this district are known as the northwest group. The southeast group is situated 1300 feet distant, but carries an entirely different class of ore—gold, silver and copper predominating. Taking the principal tin mine, the Cajalco, as a central point, 700 feet northwesterly from the main shaft, a well-defined vein of tin ore occurs; 75 feet southeasterly a strong line of croppings show a promising vein of 325 feet in the same direction and the tin-bearing vein occurs, showing a long line of croppings which give high assays. Also in the same course three parallel veins are encountered, and at a distance of 600 feet the Little Scotty is seen with an incline shaft 15 feet deep sunk on a rich body of tin ore.

Samples of this ore show 20 per cent black tin. Six hundred feet southeasterly from the last-named vein, heavy croppings occur, which have been opened by a 10-foot shaft, the ore containing both copper and tin. The color of the latter changed from a brownish-red to a light-gray and bright rose color. The district extends about 1½ miles southeasterly from the last-named mine. In this distance 17 well-defined veins occur carrying tin-bearing ore. The principal development in this district has been on the Cajalco, one of the mines of the northwest group. Its course is north, 30 east, magnetic, with a dip of 74 degrees northwesterly. The vein crops boldly, showing an average width of 30 feet, and is traceable for a long distance. Lying parallel and within a distance of 300 feet, heavy croppings of other veins come to the surface.

Developments.

At a point in a ravine 140 feet below the summit an adit-level has been driven northeasterly 432 feet, from which surface connections have been made by two shafts, and winzes sunk to a lower level. The workings show a width of six feet, with a rich chute of tin ore 200 feet long, leaving an eight-foot vein of rich ore in the bottom of the mine. No crosscuts have been driven. The total work of development in the aggregate equals 1186 feet of shafts, tunnels, drifts and winzes. For particulars of developments, reference is made to the accompanying plan and section. In the plan and section, the numbers 1 to 11 are points of photographic views of lode taken by flash light, showing width and character of vein.

Silver, Gold and Copper.

About one mile from Temescal Creek and 3000 feet northwesterly from the Cajalco mine a group of silver and gold bearing veins occurs. One of these claims shows a width of eight feet. On this vein the work of development has been confined to a few open cuts. From the ore exposed a number of samples were taken. As an average, the following assay results were obtained: Silver, 165 ounces per ton; gold, $7.50; copper, 15 per cent.

Gold Mines.

The Gabilan mine is situated in the southeastern portion of the San Jacinto estate and seven miles from the Cajalco mine. Its strike is northerly and southerly; dip 70 degrees easterly; formation, porphyritic granite; gangue, quartz; strength of vein from two to four feet, two feet of which has paid by mill process $50 per ton. Some $250,000 had been extracted when litigation ensued and work was suspended. This mine has been developed by an incline shaft 400 feet deep, with levels run north and south for a distance of 350 feet. The concentrates assay from $200 to $7000 per ton. Work on the mine will be resumed at an early date.

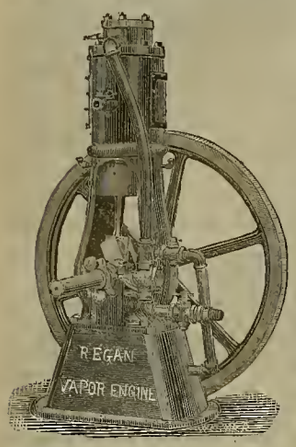
Fireclay.

The district also contains a superior article of fireclay in great abundance, which is suitable for terra cotta and porcelain.

Pottery works have been established on an extensive scale, and are in full operation at South Riverside. Work is confined, however,

(*Continued on page 162.*)

REGAN VAPOR ENGINE.



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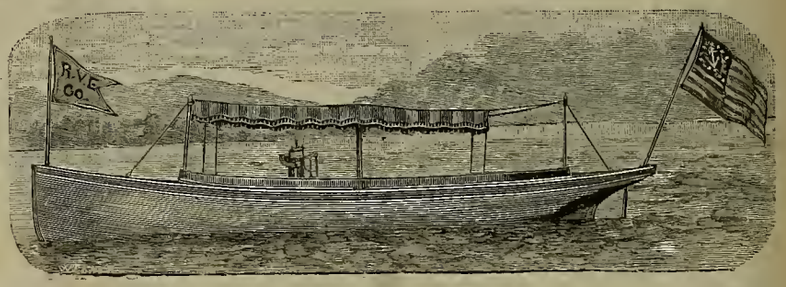
GEORGE HAAS, 824 Market St., Phelan Building, }
SAN FRANCISCO, Feb. 21, 1890. }

REGAN VAPOR ENGINE CO.—Gentlemen: The 2 H. P. Engine you put up in our factory last November, has given satisfaction beyond my expectations. It do a my work better than than those two Electric Motors did, with scarcely any expense for gas. I paid the Motor Company $25 per month for power, while the V. por Engine has cost me but $2 per month so far. But, be it understood, I have not used the Engine as much as in summer, but the cost of motor would have been all the same, making a saving of $69 in three months. I am satisfied the Engine will pay for itself in less than two years. I use it for freezing cream, run three fans, coconnut grater, etc.

Yours truly, GEO. HAAS.



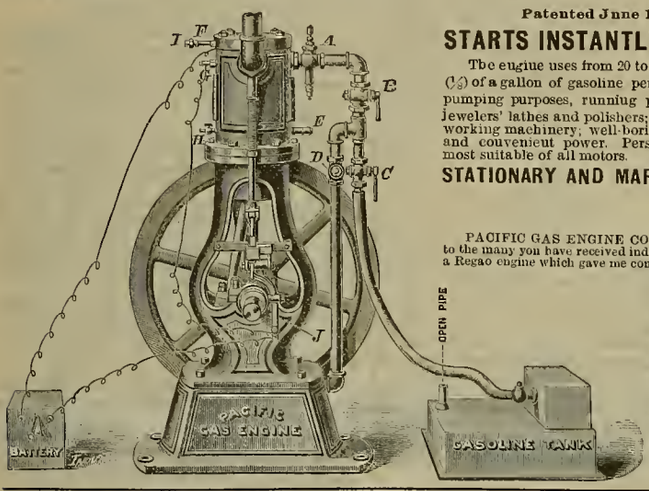
Regan Vapor Launches

The uses for small steamboats and launches are innumerable; tbsy are convenient and serviceable for transportation and are a source of pleasure for those who are fond of sailing. But many bave been deterred from purchasing such boats, because of the trouble and inconveuience of using coal, and the necessity of obtaining a Covernment license, engineer, etc. Our motor does away with these objections. The small spacs taken up by our engine in the boat **gives more room**; the boat will seat **twice** as many persons as one the same size fitted up with a steam engine. It takss only **two minntes to get under headway**, and can be stopped when running at full speed within the length of the boat, ths reverse motion being instantaneous and effective. We carry in stock six regular sizes of bulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos. Kane & Co., Racine, Wis.

REGAN VAPOR ENGINE CO., 221-223 First St., San Francisco, Cal.

THE PACIFIC GAS OR GASOLINE ENGINE.

Patented June 17, 1890—Nos. 430,504, 430,505, 430,506. Also in Great Britain and other foreign countries.



STARTS INSTANTLY WITHOUT THE NECESSITY OF BOILER, FIRE OR EXPERIENCED ENGINEER.

The engine uses from 20 to 25 cubic feet of coal gas, or about one-eighth (⅛) of a gallon of gasoline per hour per horse-power. It can be used for pumping purposes, running printing presses, small factories, elevators, jewelers' lathes and polishers; dairymen's, agricultural, mining and wood-working machinery; well-boring and all other purposes requiring cheap and convenient power. Persons having but little space will find this the most suitable of all motors.

USE IN BOATS.—The Company make a specialty of ENGINES FOR SMALL BOATS AND LAUNCHES, and claim there is no engine in the market their superior for this purpose. Boats so fitted require no licensed engineer or pilot, as is required by law for all vessels propelled by steam power.

ELECTRIC LIGHTING.—The engines are PARTICULARLY ADAPTED, and cannot be equaled for operating small electric light plants, either arc or incandescent.

STATIONARY AND MARINE ENGINES FROM 3-4 TO 15-HORSE POWER. OVER 100 IN ACTUAL OPERATION.

READ THESE TESTIMONIALS.

ALAMEDA, April 8, 1890.

PACIFIC GAS ENGINE CO.—GENTLEMEN: Permit me to add my testimonial to the many you have received indorsing your engine. As you are aware, mine was a Regao engine which gave me considerable trouble. I had to remove the head and raise the tappet valve every time I wanted to start the engine. I sent you the engine; you removed all the Regan appliance except the cylinder and stand. You put in your appliances, bead, sparking device, inlet valve, and, in fact, changed it to the Pacific Gas Engine, which now works splendidly. I have not had to remove the head from any cause since you made the change (over two months). It gives me no trouble, my boy, 14 years old, attends to it.

The change from the Regan to the Pacific is a decided improvement. I can also get a third more power since the change, and I cheerfully recommend your engine as being simple, effective and cheap.

Respectfully yours,
B. S. HILL.
Cor. Encinal Ave. and Morton St.

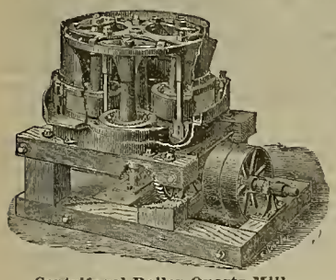
U. S. MARINE HOSPITAL SERVICE, DISTRICT OF THE PACIFIC. }
SURGEON'S OFFICE, PORT OF SAN FRANCISCO, Feb 1st, 1890. }

TO THE PACIFIC GAS ENGINE CO.—GENTLEMEN: In answer to your letter of inquiry, of the 23d ultimo, relative to the working of the two-horse power vapor gas engine, recently set up by you at the U. S. Marine Hospital, Mountain Lake, near the City of San Francisco, Cal., I have to say that, up to date, the engine has given entire satisfaction, developing the power required in the specifications: of "raising 20,000 to 30,000 gallons of water 100 feet high through 600 feet of two-inch iron pipe, to tanks on the hill, in 24 hours." It is more economical than steam, requires less attention, and can be set in operation at a moment's notice.

If it continues to do its work as satisfactory as it has done since December 22 1889, when placed in operation, it may be pronounced a perfect success.

Very respectfully, PRESTON H. BAILHACHE,
Surgeon U. S. Marine Hospital Service, Custodian.

PACIFIC GAS ENGINE CO.,
230 FREMONT STREET, - - SAN FRANCISCO.
Send for Circular and Price List.



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F. A. HUNTINGTON.
MANUFACTURER OF
CENTRIFUGAL ROLLER QUARTZ MILLS,
Concentrators and Ore Crushers,
Mining Machinery of Every Description. Steam Engines and Shingle Machines.
SEND FOR CIRCULAR.
213 FIRST STREET, SAN FRANCISCO, CAL.

THE "VULCAN"
ICE & REFRIGERATING MACHINERY
—FOR—
BREWERIES,
PACKING HOUSES,
HOTELS,
COLD STORAGE,
FRUIT STORAGE,
CREAMERIES.

ENTERPRISE BREWERY, San Francisco.

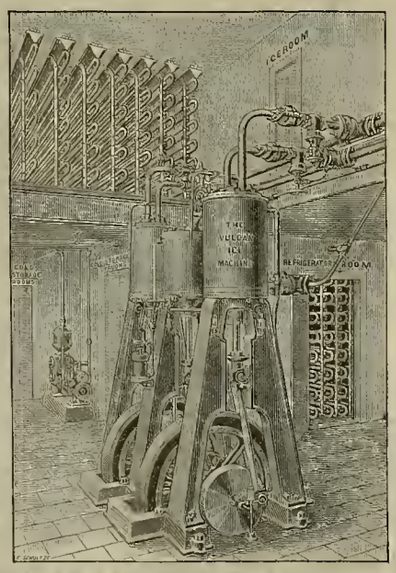
The 25-ton Refrigerating Machine has been running continuously since 1887 and has proved economical and satisfactory in every respect.

HOTEL RAFAEL, San Rafael.

The "Vulcan" Ice and Refrigerating Plant is satisfactory in every respect, * * * a model of good workmanship. The ice is clear.

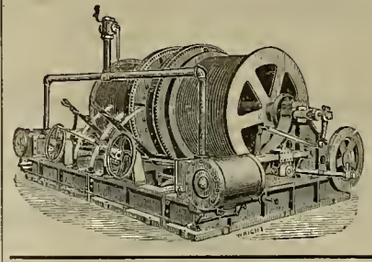
CHAPMAN AMMONIA VALVES.
ANHYDROUS AMMONIA

VULCAN IRON WORKS, 135-145 FREMONT ST., SAN FRANCISCO.

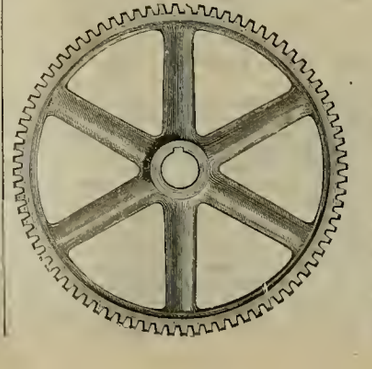


DEWEY & CO. {220 MARKET ST. S. F. Elevator, 12 Front.} **PATENT AGENTS.**

HOISTING ENGINES FOR MINES



1, 2, or 4 Drums, with Reversible Link Motion or Pat. Improved Friction.
MADE ONLY BY THE
LIDGERWOOD M'F'G CO.,
96 Liberty St., New York.
34 and 36 West Monroe St., Chicago.
197 to 203 Congress St., Boston.
PARKE & LACY CO., Agts., San Francisco.
Joseph M. Arthur, Portland, Oregon.
Send for Catalogue.



A. J. VAN DRAKE,
Machinist and Mechanical Engineer,
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SPUR AND BEVEL GEARS CUT TO ORDER.
Patent Models
And Experimental Machinery of All Kinds
Shafting, Pulleys and Boxes,
Engines and Boilers.
DRAWINGS, PLANS and SPECIFICATIONS made for new machinery.
Jobbing of every description promptly attended to.
FINE WORKMANSHIP GUARANTEED.

Metallurgy and Ores.

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SMELTING and LEAD CO.,
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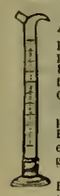
GOLD AND SILVER REFINERY
And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

—MANUFACTURERS OF—
BLUESTONE,
LEAD PIPE,
SHEET LEAD,
SHOT, Etc., Etc.
ALSO MANUFACTURERS OF
Standard Shot-Gun Cartridges,
Under Chamberlin Patent.

JOHN TAYLOR & CO.,
IMPORTERS AND DEALERS IN
ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,
ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.
63 & 65 First St., cor. Mission, San Francisco.



We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

M.C.C.² BATTERSEA

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents for the **Morgan Crucible Co.**, Battersea, England. Also for **E. G. Denniston's** Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.
NO. 23 STEVENSON STREET,
Near First and Market Streets, S. F.
C. A. LOCKHARDT, Manager. ESTABLISHED 1869

Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.

C. A. LUCKHARDT & CO.,
(Formerly Huhn & Luckhardt,
Mining Engineers and Metallurgists

GREAT REDUCTION!
BATTERY SCREENS.
Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.

PERFORATED SHEET METAL
For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut or hurred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

San Francisco Pioneer Screen Works,
221 & 223 First St., San Francisco, Cal.
JOHN W. QUICK, Proprietor.

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ATTORNEYS AND COUNSELORS AT LAW,
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WANTED—A SECOND-HAND
12 to 15-Inch
CENTRIFUGAL PUMP.
Send Price and Description to
H. W. BLAISDELL, - - - OGILBY, CAL

Postmasters are requested to be sure and notify us when this paper is not taken from their office. If not stopped promptly through oversight or other mishap, do us the favor to write again.

AMALGAMATING MACHINERY.
Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts. Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

FRASER & CHALMERS,
MINING MACHINERY

CONCENTRATING MACHINERY.
Bleke, Dodge and Comet Crushers, Cornish Crushing and Finishing Rolls. Hartz Plunger and Collom Jigs. Frue Vanner & Embrey Concentrators, Evans', Calumet, Collom's and Rittenger's Slime Tables. Trommels, Wire Cloth and Punched Plates. Ore Sample Grinders and Heberle Mills.

IMPROVED CORLISS AND SLIDE VALVE STEAM ENGINES. ❖ BOILERS HORIZONTAL, VERTICAL ... AND SECTIONAL. ...

IMPROVED STEAM STAMPS

Hoisting Engines,
Safety Cages,
Safety Hooks,
ORE CARS, WATER & ORE BUCKETS,
Air Compressors,
Rock Drills, Etc.
GENERAL MILL AND MINING SUPPLIES, ETC.
Sectional Machinery
FOR
MULE-BACK TRANSPORTATION.

Pumping Engines and Cornish Pumping Machinery,
IMPROVED WATER JACKET
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SLAG CARS AND POTS,
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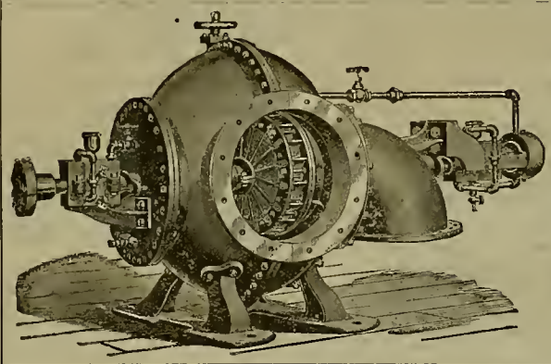
BRANCH OFFICES: NEW YORK, Room 43, No. 2 Wall St. DENVER, COLO., 1316 Eighteenth St. SALT LAKE CITY, UTAH, 7 W. Second South St. LONDON, ENG., 23 Bucklersbury, E. C. CHIHUAHUA CITY, MEXICO, No. 11 Calle de Juarez. LIMA, PERU, South America. JOHANNESBURG, TRANSVAAL, South Africa.
HELENA, MONTANA, Room 28, Merchants' National Bank Building, No. North Main St.
SOLE WESTERN AGENTS FOR TYLER WIRE WORKS DOUBLE CRIMPED MINING CLOTHS.



JAMES LEFFEL'S
Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,
Springfield, Ohio, or 110 Liberty St., New York.
FRASER & CHALMERS, General Agents, Chicago, Ill., and Denver, Col.
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BALDWIN LOCOMOTIVE WORKS.
ANNUAL CAPACITY 800. ESTABLISHED 1831.

LOCOMOTIVE ENGINES!

Adapted to every variety of service, and built accurately in standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Broad and Narrow Gauge Locomotives, Mine Locomotives by Steam or Compressed Air, Plantation Locomotives, Noiseless Motors for Street Railways, Furnace Locomotives, etc.

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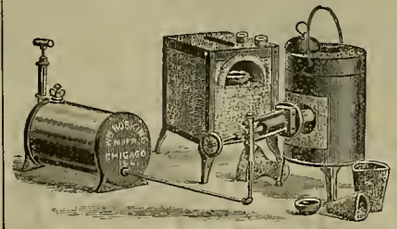
HOSKIN'S PATENT BLOW-PIPE AND ASSAY FURNACES,
— FOR —
Chemists, Assayers, Metallurgists, Engineers, Jewelers, Dentists, Etc.



NO DUST! NO ASHES!
Portable! Practical! Automatic! Economical!

Will do for every thing that a Coal Furnace or Gas Furnace will, and WITHOUT A BLOWER.

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WM. HOSKINS & CO., ROOM 51, 81 S. CLARK ST., CHICAGO, ILL.

THOMAS PRICE & SON,
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BULLION ROOMS and ORE FLOORS,
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COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.
WORKING TESTS OF ORES BY ALL PROCESSES.
SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

WINCHESTER HOUSE,
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This Fire proof Brick Building is centrally located, in the healthiest part of the city, only a half block from the Grand and Palace Hotels, and close to all Steamboat and Railroad Offices.

Laundry Free for the use of Families.

HOT AND COLD BATHS FREE.

Terms, Board and Room, $1.00 per Day
And Upward.
Rooms with or without Board.
Free Coach to the House.
T. POOLEY

"A RIGID EARTH," being devoted to Geology as Applied to Mining. By STEPHEN BARTON. In this work the author addresses himself to intelligent Miners who have, to some extent at least, familiarized themselves with the accepted theories of elementary geology. He has grouped together numerous observed facts tending to disprove the famous theory, and to establish the proposition that below the action and influence of the atmosphere all fissures grow narrower with depth—that metal-bearing veins are produced by causes acting near the surface; and that the realm of successful mining never penetrates the earth one mile. PRICE $2.00. J. C. WARD, General Agent, 64 Main Street, Visalia.

Practical Treatise on Hydraulic Mining.
BY AUG. J. BOWIE, JR.

This new and important book is on the use and construction of Ditches, Flumes, Dams, Pipes, Flow of Water on Heavy Grades, methods of mining shallow and deep placers, history and development of mines, records of gold washing, mechanical appliances, such as nozzles, hurdy-gurdys, rockers, undercurrents, etc.; also describes methods of blasting; tunnels and sluices; tailings and dump; duty of miners' inch, etc. A very practical work for gold miners and users of water Price, $5, post-paid For sale by DEWEY & Co., Publishers, 290 Market St., San Francisco.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 4, 1890.

General trade shows a steady increase; a large business is looked for the coming week, owing to an influx of buyers to take part in the Admission-Day celebration.

The local money market is gradually growing in ease under freer remittances from the country and more confidence felt by capitalists in the future.

MEXICAN DOLLARS—The market has held strong throughout the week at 92@92½ cts.

SILVER—The local market has been quoted by the Mint at $1.18¾, while local speculators bought at $1.19, with, at times, paying a slight advance. The bulk of that held here has been placed. By comparing the prices given below with the daily quotations furnished to the New York press, as given under our Eastern Markets by telegraph, it will be seen that the Department at Washington pays quite an advance for direct offers. On Aug. 29th the offers of silver to the Government amounted to 1,353,000 ounces. The amount purchased was 100,000 ounces at $1.1949 and 158,000 ounces at $1.1975. The majority of the offers were at very high prices. On Sept. 1st the amount of silver offered to the Treasury Department was 1,215,500 ounces, and the acceptances were 15,500 ounces at $1.19¼, and 135,000 ounces at $1.19½, or 150,500 ounces in all. The total amount purchased since Aug. 13th, the date when the present law went into effect, is 3,504,000 ounces, leaving but 996,000 ounces to be purchased between now and the 13th inst. On Sept. 3d the offers of silver to the Treasury Department amounted to 2,003,500 ounces. The amount purchased was as follows: One hundred thousand ounces at $1.19¼; 200,000 ounces at $1.19½.

QUICKSILVER—Receipts the past week aggregate 197 flasks. The market remains steady at unchanged quotations.

ANTIMONY—The market is weaker at the East and also in this city. A shipment of 8735 pounds was made the past week to New York.

BORAX—Receipts the past week aggregate 941 centals. The Pacific Borax Co. will ship by the J. B. Thomas 2000 ctls. to New York. The market is steady at current quotations.

LIME—Receipts the past week aggregate 2628 bbls. This shows quite a falling off. The near approach of winter is an unfavorable influence on the market.

TIN—Imports the past week aggregate 2461 ingots from Australia and 8468 boxes from Liverpool. The market locally is easy, but for shipment plate is strong, with no concession obtainable. The advance in silver is in favor of holders.

IRON—Imports the past week aggregate 100 tons from Oregon. The market is firm, with a more general consumption reported. Some shipments are being made up north. Both English and Eastern advices are favorable to higher prices, for the demand is reported active, with many furnaces sold well ahead.

COPPER—The market is strong. Mail advices from the East report sales for future delivery at over 17c for Lake. The consumption in America and also in Europe is large, being slightly in excess of the output of the mines.

COAL.—Imports the past week aggregated as follows: Sydney, 1945; Coos bay, 1150; Hiogo, 1850; Tacoma. 4296; Overland, 20. Total, 9261 tons. Carbon Hill is again in market. A fine sample from Alma, Wyoming, is on the market. The market is very strong at the recent advance. The buying for household purposes has been quite free; many are laying in their winter supplies. Some larger dealers look for still higher prices for Australian, while others again think that there will not be another advance soon. Ships are being loaded in Australia, while free shipments are being made from England. The Puget Sound collieries are increasing their output.

Eastern Metal Markets.

By Telegraph.

NEW YORK, September 3.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	54½	1 18¾	$16 75	$4 72½	$22 10
Friday	54½	1 19	16 80	4 72½	22 10
Saturday	54½	1 18¾	16 80	4 72½	22 10
Monday	54½	....	....	....	....
Tuesday	54½	1 18¾	16 75	4 80	21 85
Wednesday	54½	1 18¾	16 75	4 82½	21 85

NEW YORK, September 2.—Borax not largely wanted; 9@9½c; refined and powdered, no new business. Crude Sperm Whale out of stock. Lake Copper strong, first hands, 17c; Arizona, 15½c; casting brands plenty, 14¼@14¾c. Pig Lead held stiff at $4.80; $4.70@4 75 bid. Sales light.

Coal.

TO LOAD.	Per Ton.	FROM YARD.	Per Ton.
Australian	$ 8 00@$ 8 50	Wellington	$ 9 00
Liverpool St'm.	8 00@ 8 25	Greta	11 00
Scotch Splint.	8 25@ 8 50	Carbon Hill	7 00
Cardiff	8 50@ —	Nanaimo	9 00
Lehigh Lump	15 50@17 00	Sydney	9 50 @10 00
Cumberland bk	13 50@ —	Gilman	9 50
Egg, hard	15 00@ —	Seattle	9 50
		Coos Bay	7 00
CANADIAN ANTHRACITE COAL.		Cannel	12 00
Egg, ship side	$12 50	Egg, hard	10 00
Egg, yard	15 00	Cumberland, in sacks	16 00
Stove, yard	15 00	do. bulk	15 00
Nut, yard	15 00	Wallsend	9 00@ 9 50

Sales at San Francisco Stock Exchange,

THURSDAY, Sept. 4, 9:30 A.M.

450 Alpha Con.....1.25@1.30
50 Alta.....1.05
450 Andes.....1.25@1.30
150 Belcher.....3.25
100 Bodie.....1.20
300 Bullion.....2.75
200 Bulwer.....25
250 Challenge Con.....2.40
100 Chollar.....3.35
100 Con. Cal. & Va.....4.95
15 Confidence.....5.50
100 Con. Imperial.....40c
300 Crown Point..2.80@2.85
500 Exchequer.....1.00
100 Gould & Curry.....2.30
300 Hale & Nor...2.50@2.65
200 Hendricks.....40c
800 Julia.....35c
150 Kentuck.....1.55
300 Lady Washington....65c
100 Nevada Queen.....80c
250 Occidental.....1.05
200 Ophir.....5.12½
150 Overman.....2.20@2.25
200 Peer.....10c
200 Peerless.....10c
300 Potosi.....6.75@6.87½
70 Savage.....3.90
200 Scorpion.....35c
100 Seg. Belcher.....1.40
50 Sierra Nevada.....2.90
100 Silver King.....60c
200 Utah.....80c
100 Weldon.....10c
250 West Comstock.....60c
300 Yellow Jacket.....3.40

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
A'ta M Co	Nevada	39	50	Sept 1	Oct 7	Oct 29	L Osborn	309 Montgomery St
Best & Belcher M Co	Nevada	47	25	Aug 21	Sept 25	Oct 17	L Osborn	309 Montgomery St
Cons Imperial M Co	Nevada	28	5	July 17	Aug 20	Sept 11	C L McCoy	329 Pine St
Gover M Co	California	2	25	July 15	Aug 20	Sept 6	Gray Dew	13 and 15 Fremont St
Gray Eagle M Co	California	19	5	Aug 25	Sept 29	Oct 20	J M Buffington	303 California St
Guascaran & California M Co	Honduras	2	10	Aug 12	Sept 20	Oct 8	E Oliver	22 Montgomery Ave
Humboldt M & M Co	Nevada	1	1	Aug 16	Sept 29	Oct 25	J C Ruddock	35 New Montgomery St
Kentuck M Co	Nevada	22	30	Aug 18	Sept 22	Oct 14	J W Pew	310 Pine St
Locom tive M Co	Arizona	8	5	Aug 13	Sept 18	Oct 6	A H Fish	309 Montgomery St
Mayflower Gravel M Co	California	48	20	Aug 5	Sept 6	Sept 29	J Morzio	328 Montgomery St
Occidental Cons M Co	Nevada	7	23	Aug 5	Sept 11	Oct 7	A K Durbrow	309 Montgomery St
Peer M Co	Arizona	9	10	Aug 7	Sept 12	Oct 3	N T Messer	309 Montgomery St
Peerless M Co	Arizona	15	15	Aug 14	Sept 23	Oct 14	A Waterman	309 Montgomery St
Teresa M Co	Mexico	2	5	Aug 13	Sept 18	Oct 8	A Chemmant	328 Montgomery St
Trojan M Co	Nevada	19	10	July 10	Aug 23	Sept 8	M L Templeton	533 Kearny St
True Cons M Co	California	9	25	May 25	July 21	Sept 15	J C Bates	434 California St
Union Cons M Co	Nevada	41	23	July 21	Aug 26	Sept 15	A W Barrows	303 California St
Utah Cons M Co	Nevada	10	25	Aug 5	Sept 15	Oct 2	A H Fish	309 Monlgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Con Golden Gate Sulphuret M Co	Cal.	F B Oliver	320 Sansome St	Annual	Sept 11
Grand Prize M Co	Nevada	R G Grayson	327 Pine St	Annual	Sept 16
Gray Eagle M Co	Nevada	A W Barrows	303 California St	Annual	Sept 17
Inyo Marble M Co	California	G W Luce	132 California St	Annual	Sept 12
Mono G M Co	California	B L Burling	309 Montgomery St	Annual	Sept 18
North Occ.deutal M Co	Nevada	W H Watson	304 Montgomery St	Annual	Sept 9

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Caledonia M C	Nevada	A S Chemmant	328 Montgomery St	08	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	April 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 25
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgmery St	1 00	Sept 11

San Bernardino County.

(Concluded from page 159.)

at present to the manufacture of pipe, tiles and firebrick, which are said to be equal to the imported article.

Stone and Coal

For macadamizing purposes, a hard, dark-colored porphyry, about three miles northwesterly from the Cajalco mine on the San Jacinto estate. A quarry has been opened, and the product is being extensively utilized for paving purposes, particularly in Los Angeles. A short distance below the quarry, reduction works have been erected and are in operation for breaking the rock to a proper size for street purposes.

A coal measure of unknown extent for value is being exploited in this section. Limestone also occurs.

Water Supply.

Water, that important factor for the successful working of metalliferous ores, particularly ores of tin that require concentration, is supplied in efficient quantities for all practical purposes in Temescal Creek, which runs along and upon the western portion of the ranch. In the driest season at least 400 miners' inches flow in the creek, with large reserves percolating through the sandy and gravelly formation of its bed. A submerged dam from the bedrock up would much more than quadruple the flow. This, if raised to a hight of from 15 to 20 feet above the surface, would create an artificial lake, from which a very large and permanent supply of water could be secured not only for an extensive water-power, but for irrigation purposes for large areas of agricultural land equal to any in Riverside, which is in the vicinity, and where water for irrigation can be procured, the land sells for high prices.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 14.		WEEK ENDING Aug. 21.		WEEK ENDING Aug. 28.		WEEK ENDING Sept. 4.	
Alpha	1.00	1.20	1.10	1.20	1.15	1.30	1.10	1.25
Alta	.95	1.05	1.05	1.15	1.05	1 20	.90	1.15
Andes	.50	.55	.50	.70	.70	1.25	1.10	2.35
Belcher	2.70	3.15	2.80	3.10	3.05	3.30	3.05	3.15
Best & Belcher	2.75	3.10	2.85	3.15	3.15	3.50	3.30	3.70
Bullion	2.20	3 10	2.20	2.70	2 80	3.00	2.35	2.75
Bodie Con	.90	1.15	.95	1.30	1.25	1.50	1.20	1.45
Bulwer	....	....	.20	.25	.25	.30	.25	....
Commonwealth	2.95	3 05	2.50	2 70	2.55	3.05	3.00	3.10
Con. Va. & Cal	3.50	3 8	4.30	4.1	4.05	5.00	1.50	4.35
Challenge	1.90	2 25	2.05	2.20	2 20	2.40	2.20	2.35
Chollar	2.40	2.70	2.45	2.70	2 70	3.45	3.10	3.35
Confidence	5.00	5.75	5 00	....	5.00	5.5	5.37	....
Con. Imperial	.30	.35	.30	.40	.40	....	.40	....
Caledonia	.25	.40	.30	....	.35	.45	.45	.50
Crown Point	2.20	2.75	2.40	2.6	2.55	2.8	2.55	2.80
Crocker	.25	....	.20	....	.15	.25	.20	.25
Del Monte	1.00	1.35	....	....	1.20	....	1.20	....
Eureka Con	3.95	4.25	4.00	4.25	4.50	4.90	....	....
Exchequer	.50	.80	.75	.95	.85	.95	.90	1.00
Grand Prize	.25	.30	.30	....	.25	.35	.30	....
Gould & Curry	1.75	2.15	1.85	2 30	2.25	2.45	2.15	2.45
Hale & Norcross	2.05	2.60	2.15	2.60	2.45	2.90	2.35	2.70
Julia	.15	.20	.20	.25	.25	.30	.25	.30
Justice	1.20	1.40	1.30	1.35	1.35	1.40	1.40	....
Kentuck	.85	1.05	.90	1.05	.90	1.10	1.15	1.50
Lady Wash	.30	.35	.31	.30	.30	.40	.45	.70
Mono	.35	.40	.40	.40	.50	.70	.50	.50
Mexican	2.85	3.15	2.85	3.20	3.10	3.45	3.05	3.45
Navajo	....	....	....	....	....	....	.40	.45
North Belle Isle	1.01	....	1.05	....	1.10	....	1.05	1.15
Nev. Queen	.60	.70	....	....	.75	1.00	.90	....
Occidental	.75	.90	.80	.90	.90	1.25	1.00	1.00
Ophir	4.35	4.95	4.50	4.7	4.55	5.25	4.75	5.25
Overman	1.35	2.05	1.90	2 20	2 10	2.25	2.15	2.25
Potosi	5.25	5.62	5.50	5.50	6.12	7.37	5.00	6 62
Peerless	.15	.20	.10	.15	.10	....	.10	....
Peer	.10	....	.10	....	.10	.20	.10	.15
Savage	3.10	3 50	3 40	4.30	3.55	4.20	3 55	4 20
Sierra Nevada	1.05	1.25	1.20	1.30	1.25	1.50	1.35	1.50
Silver Hill	.20	.25	.25	.30	.25	.30	.30	.40
Scorpion	.15	.20	....	....	.20	.25	.25	.30
Union Con	2.25	2.60	2.35	2.50	2.85	3.10	2.80	3.00
Utah	.55	.65	.60	.65	.65	.80	.75	.85
Yellow Jacket	2.80	3.30	3.00	3.20	3.15	3.50	3.25	3.40

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, August 30, 1890. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 35) of One Dollar ($1.00) per share was declared, payable WEDNESDAY, September 3, 1890, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer Books close September 5, 1890, at 3 o'clock P. M.

F. B. PRITCHARD, Secretary pro tem.

Engraving. Superior Wood and Metal Engraving, Electrotyping and Stereotyping done at the office of this paper.

Assessment Notices.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of August, 1890, an assessment, No. 19, of six (6) cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 11, No. 303 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of September, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 20th day of October, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California Street, San Francisco, California.

DELINQUENT NOTICE.

GOVER MINING COMPANY—LOCATION of principal place of business, City and County of San Francisco, California; location of works, near Drytown, Amador county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 2) levied on the 14th day of July, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Cert.	No. Shares.	Amt.
Wheeler, W A	53	1,100	275 00
Pratt, Freeman	95	50	12 50
Small, John C	96	1 066	266 50
Trefethen, George	99	500	125 00
Sanhorin, Helen P	101	250	62 50
Dyer, S C	102	200	50 00
Parsons, C A	103	200	50 00
Stone, N I	142	3,000	750 00
" "	155	2,000	500 00

And in accordance with law, and an order of the Board of Directors, made on the 14th day of July, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Nos. 13 and 15 Fremont street, San Francisco, California, on SATURDAY, the Sixth day of September, 1890, at the hour of one o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

GRAY DEW, Secretary.

Office, 13 and 15 Fremont street, San Francisco, California.

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Pioneer Mining Office of the Northwest Coast.

Having the largest person at brick assay furnaces, chemical laboratory and mining office on the Northwest Coast, with a collection of about 400 samples of the ores of Alaska, British Columbia, Oregon and the Northwest Territories; and having made personal examinations of nearly every mining camp on the Pacific Slope, from California to Alaska, I am prepared to do any class of legitimate and honest mining work, such as EXAMINING, ENGINEERING, SAMPLING AND REPORTING ON THE VALUE OF ALL MINERAL, COAL AND FIRE-CLAY PROPERTIES, BUILDING STONES, EARTHS, ASSAYS AND ANALYSIS OF ORES, WATERS, CHECK SAMPLES OF ORE, PULPS, "ORGANIC ANALYSIS" WORK, and in fact any work connected with the office of a first-class mining geologist and chemist. Any information mining men may desire to know relative to the MINERAL OR COAL RESOURCES of the entire Pacific Northwest will be honestly given. Address **DR. WILLIS E. EVERETTE,** Consulting Mining Geologist and Chemist, 1318 E Street, Tacoma, Wash.

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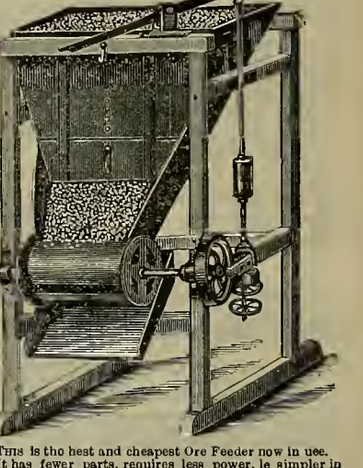

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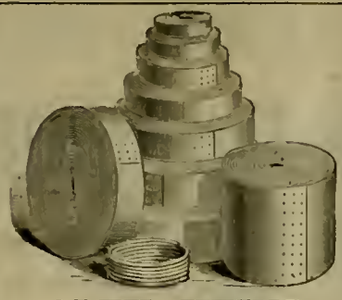

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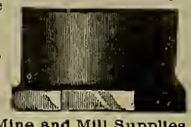

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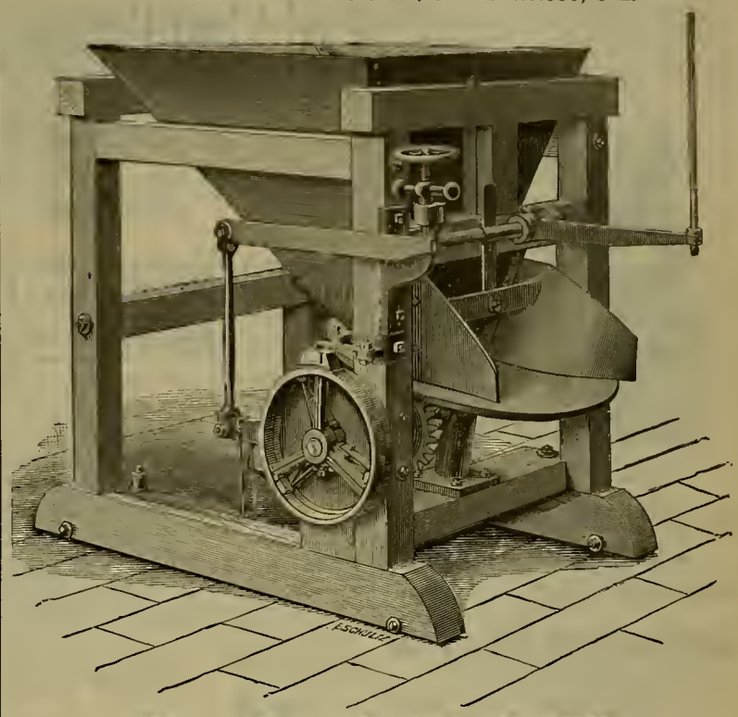

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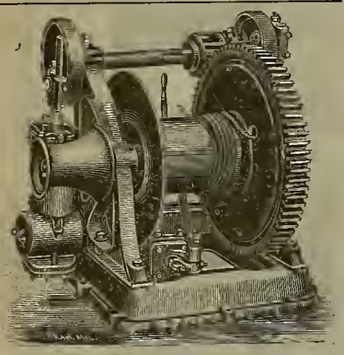

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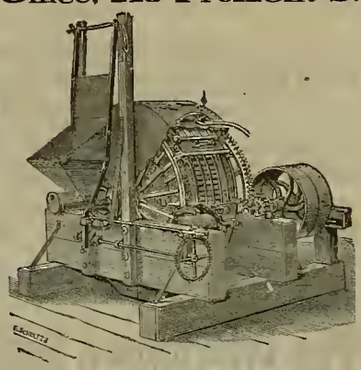

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Price of Improved Belt Frue Vanner, $825, f. o. b.
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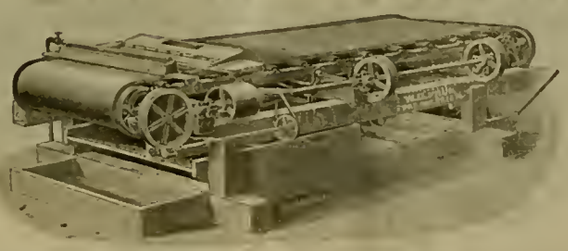

Protected by Patents December 22, 1874; September 2 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

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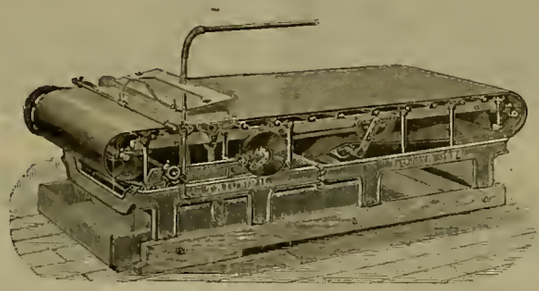

JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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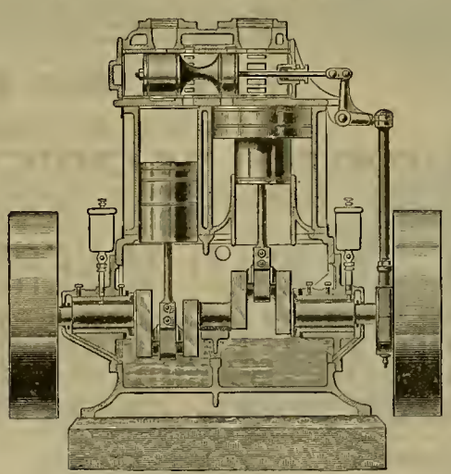
GOLDEN GATE CONCENTRATORS,
GREATEST CAPACITY OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps.



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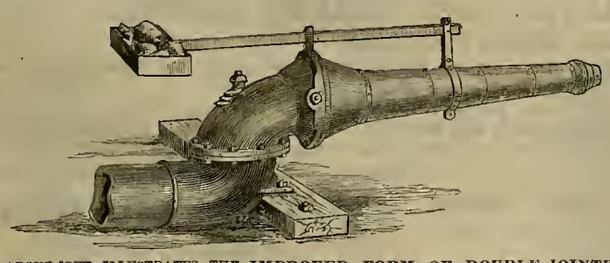

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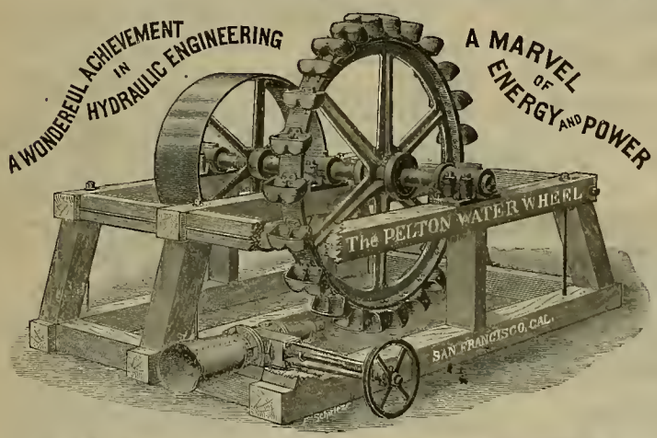
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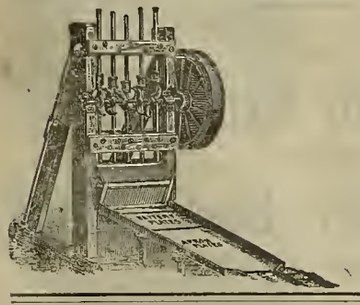

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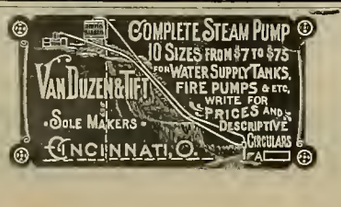
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An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 11.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, SEPTEMBER 13, 1890.

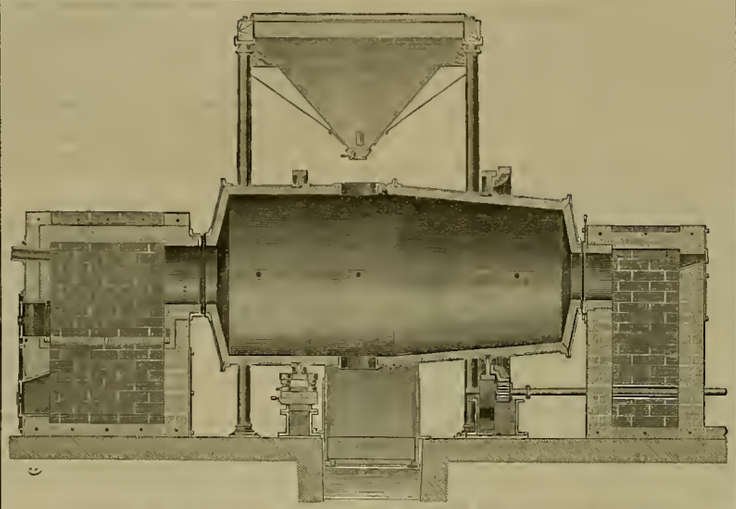
Three Dollars per Annum.
Single Copies, 10 Cts.

The Air Brush.

The application of the principle of the air brush to a tool for distributing liquid pigments upon paper or other surfaces, in the production of pictures, is a novelty in the arts, and though known but a few years has come into practical use in many departments. Of course, the instrument cannot make up for any deficiency of artistic skill in the operator, but it facilitates work and shortens the time consumed in the execution.

This artists' tool is, in brief, a device for applying liquid color by a jet of air. It consists of three parts—air pump, air reservoir and hand-piece, connected by the necessary rubber tubing. The action of the hand-piece is entirely controlled by the thumb-valve, and the artist can produce the finest line or instantly change to a broad shadow. These effects, with a single stroke, have a result that only hours of toil can equal by other means.

The engravings shown herewith will give a clearer idea of the action of the brush. It will be seen that holding the instrument low produces fine lines, that by elevating the instrument broad effects are produced, and that the artist can go from line to shadow without stopping, as seen in the cut. Supposing the instrument moved from *A* to *B*, following dotted lines, the effect would be as seen on the paper from *A* to *C*. The increased supply of liquid necessary to produce the broad effect at *C*, is regulated entirely by the thumb.

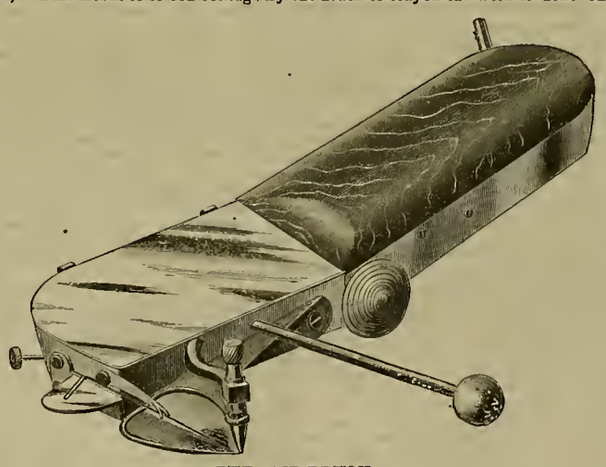


ARENTS' IMPROVED BRUCKNER ORE-ROASTING FURNACE.

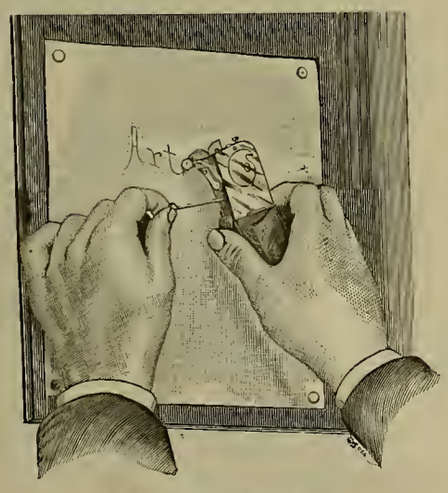
It will be understood that the mechanical contrivance is barely such as will furnish the constant, uniform current of air for carrying the liquid color, and the means of so controlling this current that it is in perfect sympathy with the slightest pressure of the thumb, the least movement of the wrist or hand on the part of the artist. The color is thrown on the paper with the rapidity of the jet of compressed air. By the brush or crayon the work is done only so fast as the hand or fingers move. It is specially used in working with India ink and water-colors, and in applying lithographers' ink to the stone. Any color or combination of colors can, of course, be used, as any dilute liquid pigment can be applied by it. It will work on any ordinary surface of paper, canvas, glass, bromide paper, etc. The effects of soft crayon and pastel are exactly reproduced by it, and the work is indelible. In draughting or designing, where much detail is desirable, the rapidity of the work permits of elaboration otherwise impossible in commercial work.

Fine lines are made by holding the instrument close to the paper, with the thumb-lever pushed forward. Broader lines are made by holding the instrument slightly higher, with the lever slightly back, to cause a larger flow of color. To produce shadows, the instrument is elevated according to the breadth of work desired, and a correspondingly large flow of color is of course obtained by pulling the thumb-lever back toward the hand. The engravings show the detail of the air brush itself, with the thumb-lever, etc.; the brush used in making a fine line; in making a broad shading; and also an operator at work with the air-receiver beside him. These implements are made by the Air-Brush Manufacturing Co. of Rockford, Ill.

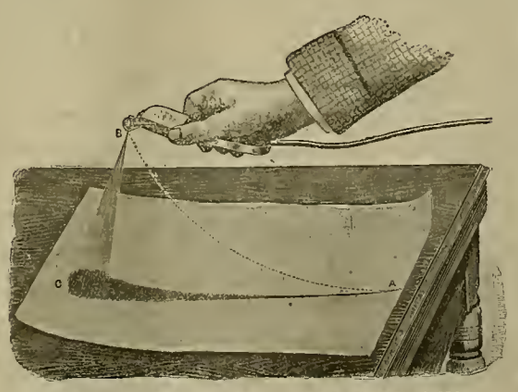
ARTIST AT WORK WITH AIR-BRUSH.



THE AIR-BRUSH.



MAKING A FINE LINE.



FROM A FINE LINE TO BROAD SHADING.

An Ore-Roasting Furnace.

The accompanying cut shows the Arents' improved Bruckner roasting furnace for ores, which, as generally made, roasts in charges of five tons each, three of which may ordinarily be finished in 24 hours. Like the Bruckner, it revolves horizontally about its axis and has a fireplace on one end of the roasting chamber with the flue at the other.

Its difference from and advantage over the Bruckner consists in the roasting chamber not being a true cylinder, but being made in the shape of a frustum of a cone, its base being turned toward the fireplace. In this frustum of a cone, the ore seeks the same horizontal level when revolved around its axis as in the Bruckner, and is thus forced to form a layer of graduating thickness in the chamber, with its thin end near the flue end and its thickest or deepest end toward the firepface. The flame coming from the fireplace is, of course, hottest at that end; and there, in this furnace, it finds the most ore to heat.

As the flame in its passage through the roasting chamber loses in intensity, so the ore layer becomes thinner; and there is less and less ore to heat until the flue is reached. In this manner the charge is "done" simultaneously at all points throughout the roasting chamber, which, as is well known, is not the case in the Bruckner, with its overlayer of even thickness acted upon by a flame of graduating power. The operator of the Bruckner is apt to either "overdo" the charge near the fireplace, or leave it "underdone" near the flue, entailing a greater loss in metal, in fumes or in tailings, respectively, than is necessary.

This bad feature of the Bruckner is entirely avoided in the Arents furnace, with its conical roasting chamber, as above described; and therein consists its advantage over the former, while retaining all its good features. Four of these furnaces were made by the Fulton Iron Works of this city for the Mt. Cory mine, Nevada, where they have given excellent results.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Mining Affairs at West Point.

EDITORS PRESS:—I left San Francisco on the 20th of August and arrived at West Point, Calaveras Co., on the 22d, over a route new to me. I have lived in this city nearly 40 years, and have not had a great desire for traveling in the mountains. I had been troubled with neuralgia off and on for many years, and I was advised to take a trip to the mountains and "sweat" it out of me, which I think I have succeeded in doing. The fare from here to Valley Springs by rail is $4 55; then the stage to Mokelumne Hill, $1.50; then stage again to West Point, $2 50, and perhaps $2 50 on the road for meals. Arriving in the town, I stop at the new hotel, called the Mountain View, kept by a whole-souled old Californian named H. Beauchman. Everything is kept clean and neat; the rooms are clean and airy.

I went out about two miles from the town to see a friend of mine from San Francisco named C. W. Watkins, a very enterprising, stirring miner, with plenty of "get up and do" about him. I found him at a new mine that he has opened, or rather an old shaft that he sunk on. He has great faith in that camp. He went to work and made plans for machinery and hoisting works, and from the time he got the machinery on the road from here to West Point until he had it in operation hoisting, pumping water out of the mine and taking out good ore, was only about three weeks. The mine is called the Tucker, and it is about two miles southeast from West Point. He also at one time opened and operated the Blazing Star mine, the Water Lily, the Tom Paine and several other mines that are now taking out rich ores. If that camp had a few more such men as he is, it would be one of the best mining camps in the State of California.

I went all over West Point Mining District, and from information and what I have seen it seems that many of the failures in mining are due to the incompetency of men who went to West Point to make a fortune in mining without knowing much about it. Here, as in other camps, such men buy up a lot of machinery without knowing whether it will answer the purpose or not, and open the mine thinking they will strike a bonanza right off. They spend a few thousand dollars at guesswork, come to water in the mine (as in all mines with good ledges), their pumps are not good enough to keep the water out, expenses run up, men must be paid, no ore comes out of the mine, and it is shut down. After awhile the winter sets in and there is more water in the mine; the hoisting works get out of order, the horses go to rack, the machinery is useless in most cases, and they go to San Francisco and report the mines in West Point a failure and no good. Under such circumstances, the workingmen go to other camps to mine and give the camp a bad name, when in reality the cause is incompetency or lack of funds. There are numbers of such cases at West Point, which any man can see by going through the district. All men going to West Point to mine will find plenty of wood and water very low for mining. Lumber costs about $12 per thousand. In former days, say 25 or 30 years past, this was a rich camp, mostly peopled by Mexicans. They were good miners, but would not work in poor ground, as it would not pay them. They worked on the top of the ground and in many places sunk shafts from 20 to 100 feet, until they came to water. They would then quit work and go and sink another shaft, and repeat the same thing until the camp for miles around is nothing but mining holes. From all accounts, they got large amounts of rich ore from those shafts. They could not save any sulphurets, now considered the rich part of the ore. In some cases they would pack the ore for several miles on mule-back to have it crushed in some old arastra. If the rock did not pay them $50 to $300 or $400 to the ton they would not touch it, and would go elsewhere. Many of those old Mexican mining shafts are the rich mines that are now working. All that is wanted is some capital and a little energy and "get up and get" and some common sense to make a certain success at West Point.

Mining is like any other business and has to be attended to strictly by competent men, not by overseers sitting in barrooms playing cards and letting the mine take care of itself. In such cases you must and will meet failure.

After looking carefully into the causes of failure in mining in West Point, I am thoroughly satisfied from what I heard from others and saw for myself that mismanagement and want of funds form the real cause of dullness in this camp. There ought to be 20 mills working in that district at this time. In the southeast part of the district on the Mokelumne river is a different formation. About 4 or 5 miles from the town on the Stockings Fork, the ledges are very large, from 12 to 30 feet wide, though little work has been done there.

It is not very easy getting to it. Wood and water are free and plentiful. The ore is not, I think, as rich as the ore in the granite formation, and in this part of West Point it is in slate, which miners say will not give out as soon as those mines in granite.

Among those mines that are paying well is the Blazing Star. I saw an article in your paper yesterday stating that the men working in this mine had to lease it to get their pay. The ore shipped from there to the Selby works to be smelted is highly sulphureted and pays all the way from $50 to $500 and upward to the ton, but on the average it will pay $200. It costs at least $20 to $25 per ton to ship it here for working. The free milling ore is worked at the mine in a 3-stamp mill, which the miners say will pay or nearly pay the whole expense of running the works. If all that is true, which the men who take the ore out of the mine say they can prove, then by all means the miners should be paid their hard-earned wages without having to lease the mine.

But the miners say that in the last settlement they had with the managers they only received a fraction over 50 cents on the dollar for their hard work, many of them having families to support, and the storekeepers and hotel-keepers also suffer from this sort of management, which gives the camp a name it should not have. JAMES REILLY.

1827 Stockton St., San Francisco.

Calico Mining Items.

EDITORS PRESS:—The Waterloo Mining Co., Calico, San Bernardino county, is running their 60 stamp mill and their 15-stamp mill day and night, receiving 200 tons of ore per day from the Waterloo mine and 20 tons per day from the Silver King mine.

The Runover Mining Co. has 15 stamps at its mill kept running steadily on ore from the Occidental, Oriental No. 2, Silver Monument, Red Cloud and Mammoth mines.

The Barber Milling Co. start up on chloriders' ore shortly. A good run is expected, as chloriders have, as a rule, been doing well of late.

At the Young Waterman mine 40 tons of first-class ore are awaiting treatment.

From the Sue mine chloriders will ship 50 tons for treatment to Barber mill next week.

Pluth & Greer have about 100 tons of Champion ore ready for shipment, with prospects of a continuous body of ore. This is low-grade ore, but very easily mined.

John Sutton is taking out some very rich ore from the Golconda mine.

About 220 men are employed mining in this camp.

The Atwood mine, which has been idle for some time, has started up again under new management. L.

Silver.

London *Money* of recent date says: The Indian exchanges have moved steadily up with silver, and the Indian demand proves to have in no way decreased whenever a further rise in the metal seems impending. After awhile it is to be presumed that Indian trade will completely adapt itself to the new conditions. It is likely, too, that the Chinese demand will increase, and so possibly will that of Africa. So far as can be foreseen, then, a very considerable rise in the price of silver will not diminish the consumption. Of course it is possible that, on the other hand, it may largely increase the production. The production has been steadily increasing for many years, and it seems reasonable to conclude that a rise in price will further stimulate it. But it is to be borne in mind that of all industries mining is perhaps the most precarious. The gold production of the world was augmented enormously between 1850 and 1860, although gold was falling in value. During the past ten years it has been steadily decreasing, although the value of gold has been very greatly rising. Something of the same may happen in the case of silver. Some of the mines now believed to be very rich may suddenly give out, or all of them may prove to be less rich than they were supposed to be. Whether this will happen or not it is impossible to say. All that can be asserted with confidence is that the production does not depend on the value of the metal. We have in previous articles given our reasons for believing that sales by the Continental Governments will not be very large.

YIELD OF "WORKED OUT" MINES.—The Virginia *Enterprise* says that since James G. Fair's time as superintendent of the Cons. California and Virginia mine, when he thought it pretty well worked out, the mine has paid $3,466,800 in dividends, and probably $12,000,000 has been taken out. In the Hale and Norcross Superintendent Keating has taken out probably $5,000,000 and employed a large force of men extracting and working ore that Mr. Fair left, and there is plenty of it left yet. As Mr. Fair left plenty of ore in the Hale and Norcross and in the Con. Cal. and Virginia for Mr. Lyman and Mr. Keating to work at a profit, owing to improved methods and cheaper means of extraction and handling, so will Mr. Flood leave plenty for others to do likewise.

THE EFFECT OF GUM-CHEWING has been studied carefully by an expert. In gum-chewing the masseter muscles which move the jaw are abnormally developed, and the fatty substance which produces fair, plump cheeks is deteriorated.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER X.

[Written for the PRESS by JAMES H. CROSSMAN.]

Mining Districts.

San Bernardino county contains within its borders a number of mining districts, some of which since their formation have been subdivided. The names and boundaries of the subdivisions are given as accurately as possible.

On entering the county via Los Angeles on the S. P. R. R., the first that is called to our notice is the Temescal tin district, situated in the southwesterly portion of the Rancho Sobrante de San Jacinto. This district comprises Tp. 3 south, R. 5 west, and Tps. 3 south, R. 4 west.

Black Hawk District.

The initial point of this district commences at Rabbit Springs, thence 12 miles easterly to Old Woman's Springs, thence southerly to the east side of Cottonwood canyon, along the divide of the mountains to a high point easterly from Nichols' furnace in Morongo district; thence westerly to Arastra Creek valley, passing the old Morongo mines to the summit of the range, dividing Bear valley from Arastra valley, thence westerly six miles along said summit to the headwaters of Crystal creek; thence northerly to place of beginning, including Tp. 2 and a portion of 3 N. R., and 2 and 3 east S. B. M.

Holcomb Valley

District is bounded on the northeast by the Black Hawk mining district and the valley regions; on the west by the Gold and Silver district; on the south by the northerly base of Old Grayback, comprising that area situated in Tp. 3, N. R. and 1 and 2 E.

Bear Valley.

District is located on the southwest corner of Tp. 3 N., R. 1 east, and on the southeast corner of Tp. N., R. 1 W.

Burroughs District

Commences on its southwest corner at the mouth of Burroughs canyon where the Mojave river empties into the desert; thence up the Mojave river to the southwesterly line of the Holcomb Valley district; thence northerly to the desert; thence along and skirting the base of the mountain, following the outlines of the desert to the place of beginning, and, as will be seen by reference to the map published in the PRESS, includes the Gold and Silver district.

Ruby District

Lies in the form of a triangle, the northwest corner being the northeast corner of the Black Hawk district; thence due south 12 miles; thence east 12 miles to Gus Knight's Wells; thence northwesterly to place of beginning.

The Gold and Silver Mining District

Is included within the boundaries of the Burroughs district. Its boundaries are as follows: On the south and west by Deer creek, on the north by the desert, and on the east by Holcomb valley. This district has been set off and segregated from the Burroughs district since its formation.

The Morongo District

Is bounded on the northwest by the Black Hawk's southeast boundary line; thence due south for six miles; thence east to the Mojave desert; thence N. W. to the southeast boundary of Ruby District; thence west to place of beginning.

Silver Mountain District

Commences at Stoddart Crossing on the Mojave river; thence southeasterly to Rabbit Springs; thence southwesterly to the Panamint Crossing on the Mojave river; thence due west to county line of San Bernardino and Los Angeles; thence to S. E. corner of Kern; thence to place of beginning.

Ord District

Commences at the eastern boundary of Silver Mountain District; thence easterly to S. E. corner of Dry Lake District, 27 miles; thence north 18 miles; thence east 6 miles; thence due north 10 miles; thence following the Mojave river southwesterly for 6 miles; thence southerly to Newberry Station and to place of beginning.

The Lava Bed Mining District comprises Tp. 7 N., R. 4 E. and Tp. 7 N., R. 5 E.

Calico District

Comprises Tp. 10 N., R. 1 E., the south half of Tp. 11 N., R. 1 E. and west half of Tp. 10 N., R. 2 E; commencing at a point 2½ miles west of the Waterloo Mill or Little Red Butte; thence 10 miles south; thence 10 miles to place of beginning.

Grapevine District

Is bounded on the west by Dry lake; on the east by Calico Mining District; south by the Mojave river; north by the Mojave and Death Valley wagon-road; commencing at S. W. corner of Tp. 10 N., R. 2 W., and running along the west boundary of Calico District to Paradise Springs in Paradise valley, 10 miles distant; thence west 12 miles; thence south 10 miles; thence east 12 miles to place of beginning.

Soda District

Commences at a point on the northerly end of Cronise lake; thence southeasterly to Mesquite Springs; thence northeasterly to Marl Springs; thence northwesterly to Hallaron Springs; thence west to the northeast corner of Five Point District; thence southwesterly to place of beginning, commencing at N. E. corner Sec. 3, Tp. 12 N., Range 6 E; thence northeasterly to N. W. corner Tp. 14 N., Range 8 E.; thence easterly 21 miles; thence southeasterly to N. E. corner Tp. 12 N., Range 12 E.; thence S. W. to N. E. corner Tp. 11 N., R. 7 E.; thence northwesterly to place of beginning.

Alvord District

Has its northwesterly boundary at Garlic Springs; thence southerly for 24 miles to the southwest corner of Calico District; thence easterly 12 miles; thence northwesterly 20 miles to Bitter Springs; thence west to place of beginning.

Five Point District

Is bounded on the south by the Alvord Mining District; on the east by Soda Mining District; remaining boundaries unknown.

Clark District

Comprises that region inclosed between the following boundary: Commencing at S. W. corner Tp. 16 N., R. 12 East; thence N. 3 townships (18 miles); thence east to State line boundary; thence along State line boundary to N. E. corner Tp. 17 N., R. 15 E; thence south 2 townships; thence west 4 townships to place of beginning.

New York District

Commences at S. W. corner Tp. 11 N., Range 15 E.; thence north 24 miles; thence east 18 miles; thence south 24 miles; thence west 18 miles to place of beginning.

Brier District

Comprises an area of 24 square miles, situated in Salt Wells valley, Tp. 4 and 5 N., Range 7 and 8 W., S. B. M.

Borax Lake

Mining district comprises an area of 24 square miles, and is situated due east from Brier district.

Exchequer District

Commences at S. E. corner Tp. 10 N., Range 19 E.; thence north 10 miles; thence west 12 miles; thence south 18 miles; thence east 12 miles to place of beginning.

Trojan District.

Situated in Providence mountain, comprises that section lying within the following boundaries: Commencing at the N. W. corner Sec. 34, Tp. 9 N., Range 13 E; thence northerly from the initial point 18 miles; thence east 12 miles; thence south 18 miles; thence west 12 miles to place of beginning. Since the formation of this district it has been subdivided, and that portion west of the divide is known as the Gold Belt. The southeast half of the district has received the name of the Arrow gold district. The northeastern still retains the name of Trojan.

Sacramento District.

The initial point of its boundary line is the southeast corner of Exchequer district; thence east 12 miles; thence south 12 miles; thence west 12 miles; thence north to the place of beginning. Since its formation the boundaries have been extended in an easterly direction to the Colorado river, which now forms its easterly boundary.

Scanlon District

Is a new and important mining district recently formed. It is situated in Old Woman's Mountain and has the following boundaries: Its initial point is Danby Station, on the line of the A. & P. R. R.; thence northeasterly to Bolin Mountain; thence southeasterly to Old Woman's Peak; thence southwesterly to Coyote Springs; thence northerly to place of beginning.

Twenty-nine Palms

Comprises Tps. 1, 2 and 3 North, Ranges 1 and 2 E.; Tp. 3 N., Ranges 1, 2, 3 and 4; Tp. 2 N., Rs. 1, 2, 3 and 4.

Colorado River.

West of the range of mountains bordering this river there are several mining districts whose names are unknown to the writer; they are reported to contain large veins of gold-bearing quartz, copper and lead, with some very promising veins of silver-bearing ores. Their accessibility to the Colorado river, a navigable stream for steamboats, gives these claims additional value.

(To be Continued.)

ASTRONOMICAL SOCIETY.—The next regular meeting of the Astronomical Society of the Pacific will be held in the library of the Lick Observatory on Saturday, Sept. 13th. This will be the last meeting of the year at the Lick Observatory. The following papers are announced: Prof. L. Weinek, "Drawings of the Moon;" Prof. Milton Updergraft, "Some Notes on Astronomy in South America;" A. Lenschner, "Corrections to Oppolger's Bahnbestimmung;" R. Schmidt, "A Suggestion of a Way to Forward Our Knowledge of the Asteroids;" A. O. Lenschner, "Elements of Comet Coggia (July 19th);" A. O. Leuschner, "Elements of Comet Denning (July 33d);" Prof. Daniel Kirkwood, "The Age of Periodic Comets;" E. E. Barnard, "The Photographs of the Milky Way, Taken at the Lick Observatory in 1889."

SHUT DOWN.—H. M. Wheeler from Sanborn reports the mill shut down. It has been demonstrated that the ore must be roasted to be profitably worked, and the company will doubtless build a furnace. The employes of the company were all paid off, and it is not probable that the mill will be started again until a roasting furnace is built.—*Silver State.*

Quicksilver in California.

Details of the Establishments at Work.

J. B. Randol, special agent in charge of the statistics of quicksilver for the 11th census, has completed his work, and a bulletin has been issued giving a brief summary of the more important facts obtained in the investigation. From this, we make the following abstract:

During the calendar year 1889 there were 26,464 flasks, or 2,024,496 pounds, or 1012 short tons of quicksilver produced in California. About 20 flasks (less than $1000 in value) were produced in Oregon. The product is notably less than the usual yield. In 1888, 33,250 flasks were produced.

There are in California 17 productive mines with 36 furnaces, and 3 non-productive mines with 4 furnaces. In Oregon, there is 1 non-productive mine with 3 furnaces.

The productive mines and active furnaces employ 937 operatives, of whom 416 are engaged in surface work and 521 underground. The other mines and furnaces employ 24 men, making a total of 961 employes.

Of 195,714 tons (2000 pounds each) of cinnabar ore mined, 92,964 tons were roasted, producing 26,464 flasks of quicksilver, each containing a standard quantity of 76½ pounds avoirdupois. Of the 11 establishments working ore, one reported only 200 tons produced and worked in retorts, with an average yield of 2.295 per cent, the highest percentage returned. The lowest average yield was 0.286 per cent, and the average percentage yield in quicksilver for all the ore roasted was 1.088. The largest quantities of ore produced and roasted were respectively 28,007 and 28,887 tons, and the quantity of quicksilver produced at the several works ranged from 120 up to 13,100 flasks.

At 11 active establishments there were expended $219 622 for supplies, $626,289 for wages and $35,490 for other expenses, embracing taxes, rent, interest, etc., making a total of $881,401, showing that 71 per cent was paid for wages, 25 per cent for supplies, and four per cent for all other expenses. Of the amount paid for wages, the office force absorbed $34,900, and there were paid to foremen, mechanics, miners, furnace hands and laborers, $591,323.

The cost per flask of quicksilver ranged from $65 74 to $21.66, the average cost for all being $33 21.

For the year the highest price was $50, and the lowest $40, giving an average of $45, which for the year's production, 26 464 flasks, would make a total valuation of $1,190 500 The difference between the cost, $881,401, and value, $1,190,500, is $309,099, which may be regarded as the profit on the year's work, based on the returns collected. The difference between average cost and average sale price was $11.69 per flask.

The one establishment producing quicksilver at a cost of $65.74 per flask met with a serious loss on its output, and no establishment made a profit commensurate with the risks attending the mining of cinnabar, its manufacture into quicksilver, and finding for it a market in competition with rich and important establishments carried on by foreign governments.

As to wages, foremen are reported to earn daily wages ranging from $10 33 to $2 66, mechanics, $3.60 to $2.05, laborers, $2 to $1.18, the last-named rate being for Chinamen. Boys under 16 years of age, of whom only four were employed, none underground, earned $1 and 75 cents.

One establishment reported 42 men employed on surface and underground work without classification or number of days employed, miners at $2.10 and laborers at $1.75 per day. Another establishment reported 11 white men on surface without classification, at $2.80 per day for 352 days.

For foremen of underground work the average wages ranged from $4.68 to $2.75 per day. Miners earned an average of $2.67 to $1.25, the lowest rate being paid for Chinamen, of whom a few were employed at small establishments.

During the census decade, 1880–1889, there were no strikes or labor troubles of any kind in any of the mines and works, and fair wages for good work was the rule for employers and employes.

The active establishments employed 62 steam motors, with a capacity of 2190 horse power, 54 boilers of 2438-horse power, one electric dynamo and motor of 4-horse power, and one water-wheel of 3 horse power, a total of 2197-horse power in motors. Two hundred and forty-seven animals were also reported as employed, but it is probable a greater number were in use.

Of the 16 establishments, the mines and real estate are valued at $640,470; furnaces, houses, and other surface improvements, $222,300; machinery, tools, etc., $146,150; quicksilver unsold, $124,074; bills receivable, $34 664; other assets, $165,456; estimated total capital, $1,331,114.

DANGER IN THE TIN PAIL.—At Elizabeth, N. J., Everett Gordon, an engineer on the Jersey Central, his wife and son were lately poisoned by eating some food which had been cooked in a new tin pail. They were attacked with severe cramps and vomiting. Prompt medical attendance saved their lives. An investigation showed that the victims were suffering from lead poisoning.

Money Saved by a Flood.

The Aspen Mining and Smelting Company will save a large sum of money as a result of the flood that drove it out of its lower levels. The company was extracting nearly 1000 tons of ore per month from that part of the property. This ore was all high grade, none of it running less than 100 ounces and much of it going as high as 300 ounces.

It is seldom that a flood in a mine results in a direct benefit to the owners, but this case is an exception. Floods are usually disastrous anywhere, but there are exceptions, as instanced by the annual overflow of the river Nile. The river enriches the ground and causes it to yield bountiful crops. The stream that poured into the lower levels of the Veteran has served a similar purpose, the ore having become more valuable while it has stood under water. It will not yield any more silver, but the silver will yield more money, and the difference amounts to a very large figure.

The mine was closed down on the 9th of May when silver was selling down below 95 cents an ounce. To-day the price is 25 cents higher than it was then. The additional amount that will now be received for the ore will be all added profit; and it is estimated that the mineral which would have been extracted during the shut-down will now bring $100,000 more than it would at the old price. This will mean $100,000 additional profit to the company, enough to pay five dividends of $20,000 each.

During the interval the company has been at work on its low-grade lead ore bodies in the upper part of the mine, which are not so much affected by the price of silver, and the management are very well pleased with having been kept out of the rich chutes. The Franklin, of course, has been quite a heavy loser, as its product would not have been heavy, but the Aspen Mining and Smelting Company can repair any damage to its work and pay its share of pumping expense without making any material inroad upon the figures representing its gain by the occurrence.

The water in the Veteran has fallen 98 feet and is now seven feet below the Franklin level. It is receding at a rate of from 15 to 18 inches per day. A further fall of 38 feet will open the second level in which there is a breast of rich ore from seven to eight feet thick.

The electric diamond drill is working smoothly. It is now being operated in the first level north. One hole has been driven 96 feet into the hanging-wall. The drill has been in blue lime all the way, but the core now shows indications of shale.—*Aspen, Colo., Times.*

Indian Territory Gold-Fields.

A Denver letter in the St. Louis *Globe-Democrat* says: For years rumors of wonderful gold-fields in the Indian Territory have been in circulation among a few of the old-time prospectors of the West. Their wealth has been reported so great as to almost stagger the most excited imagination. The Indians have, however, so closely guarded these fields that a thorough investigation has been utterly impossible. Lieutenant-Colonel S. Snyder, who was recently transferred from Oklahoma City to Santa Fe, arrived here, and during a conversation upon this matter said:

"One day last winter a stranger, who had every appearance of a prospector, came to me at Oklahoma City and introduced himself as Hale. He said he had lost his fortune and for some time had been prospecting in the Cheyenne country of the Indian Territory, north of the Red river. He had suffered many hardships, and narrowly escaped with his life from the Cheyennes, who guard their country most carefully against intrusion."

The same story was told the *Globe Democrat* correspondent recently by a gentleman from Wichita, who said: "The time is not ripe yet for the public to be informed on the subject, but there are gold deposits in the hills and valleys near the Red river which are richer than anything now known in the world. I met hunters and prospectors who have been on the spot and whose stories were so startling as to seem like an Eastern fable. I will tell you one thing, however, a big syndicate of leading politicians and capitalists has been formed, and next fall a strong party is to be started for the gold-fields to learn the truth concerning the mines. The party has already been enlisted and is backed by such men as Senator Ingalls and Senator Plumb. The district in which the gold is said to be found is in the southwestern part of the Indian Territory, about 200 miles from Oklahoma."

West American Oaks.

Some time ago James McDonald of this city generously furnished the means for the publication of the life work of the late Dr. Kellogg in relation to West American oaks. Recently a second part of the work has been published, and in a prefatory prepared by Prof. George Davidson, who was a life-long friend of the late doctor and took a good deal of interest in having placed before the public the work of his friend, the professor says: "Upon the publication of the first part of this work, the 'West American Oaks,' Mr. McDonald was impressed with the necessity of further examination and study of the new species and varieties mentioned therein. These had not been known to Dr. Kellogg; the systematic plan of collection, investigation and representation, which was his life work, being broken by declining health and adverse circumstances.

"After a few copies of the work had been sent out, the further distribution was suspended until the new species should be illustrated, and Mr. McDonald suggested that special examination should be made to secure satisfactory specimens. When the matter had been fully discussed, Prof. Greene volunteered to give his vacation for the summer to field work in the Sierra Nevada and in the Rocky mountains of Colorado and Montana. Mr. McDonald generously bore all the expenses of the trip, and the result has been the verification of former species and the acquisition of new ones. Prof. Greene has since employed his hours outside of University duties in the description of all these species, and in the direction of the drawing by Mr. George Hansen."

This addition by Prof. Greene makes the history and bibliography of the work complete, and makes it one of the most interesting additions to works heretofore published in relation to forest trees. The engravings are of the finest, and are beautiful representations of the several varieties of the oak thought worthy of illustration.

The Proctor Observatory.

Mrs. Richard A. Proctor, widow of the late Professor Proctor, who has been looking around in this State for a site upon which to locate the Proctor Memorial Observatory, recently returned to San Miguel after a three-weeks' sojourn at the Lick Observatory, and the following is from an interview she had with a representative of the San Miguel *Union:*

"Did the professors favor the location?" asked the *Union* representative.

"Unanimously," Mrs. Proctor answered as the car moved off; "they believe it is not only the place for night studies, but also to view the sun. At Lick they are unable to get the sun at all because of the altitude, the radiations reflected from the valley causing a constant disturbance. You would not think so looking off from the summit with the unaided eye, but you find out where the trouble lies in trying a telescope. Then in the winter they cannot make observations at Lick, while on San Miguel the professors believe I could have an all-year observatory. They know of this climate and give their opinions understandingly. In fact, they were enthusiastic about San Miguel and promised to aid me in every possible way. One of them offered to come down and set up the instruments."

"Shall you test the peak with a telescope this time?"

"That is one thing which brings me back. I am anxious to see Mr. A. H. Isham and arrange to take a glass to the summit. Any small telescope would answer. I have a long list of points to be ascertained, including sun-viewing and what is known as 'seeing.' What grand news it will be to write back to Lick that San Miguel stands the test! The professors were so exceedingly kind in giving me opportunities to use the instruments and also instructions as to their use."

Mining Bureau Museum.

Following are some of the recent additions to the collection of the State Mining Bureau:

Fossils from Sespe, Ventura county, and from Orange county, Cal.

Large number of specimens of gold quartz from various mines of the State.

Miocene fossils from Virginia.

Fossils from both sides of the Mother Lode of California, C. D. Voy.

Pilinite, large and very remarkable specimen, New Almaden, Cal., J. B. Randol.

Sapphires, Ceylon, Williamsburgh Scientific Society, New York.

One ounce nugget of platinum from Old Eagle mine, Trinity county, Cal., Fritz Weckel.

Platinum nuggets from Chapman & Fisher mine, Trinity county, Geo. Chapman.

Nine samples placer gold from one-fourth ounce up to one ounce weight, from a series of mines in Trinity county, showing the variation in character of the gold; from the owners of the mines.

Native mercury and cinnabar, Trinity county, Cal.

Rich argentiferous carbonate of lead ores from the celebrated Broken Hill mines, New South Wales, Australia, P. Edwards.

Hessite (telluride of silver), Carson Hill, Calaveras county, Cal.

A remarkable specimen of gold quartz from the Adelaide mine, Robinson's Ferry, Tuolumne county, Cal. The gold seems to have been rubbed down by a movement of the formation; Harvey Wood & Bro.

Pyrophyllite and glacier-polished granite, Mariposa county, D. A. Marston.

Chromic iron, copper ores, sulphur, building stones and other minerals, etc.

The number of catalogued specimens is now over 12,000, besides a large number of sundries not entered.

THE Spokane Falls *Review* says: The appointment of Mrs. N. H. Owings of Olympia to be Commissioner of the State of Washington to the World's Fair is generally commended by the press. She is the owner of considerable valuable real estate in Olympia, and an energetic woman of good judgment in business affairs.

Government Irrigation Work.

Reports in Washington correspondence bring more definite information concerning the outcome of the issue between different groups of Congressmen on the provisions for Government irrigation and the character of the work. The statement is that "the conferees on the Sundry Civil Appropriation bill have at last come to an agreement on the bothersome survey and irrigation question." The result is a complete victory for the Senate, its action in striking out the irrigation appropriation of $720,000 having been fully sustained. What the irrigation survey loses, the topographic survey partially gains, the allowance for this branch of Major Powell's work having been increased from $200,000 in the House bill to $300,000 in the Senate's amendment and to $325,000 in the conference report. The amount voted by the Senate for the public-land survey is reduced from $600,000 to $425,000. The House originally gave only $200,000. A compromise is also effected as to the land-entry question. The legislation of 1888, withdrawing from sale lands west of the 100th meridian, has been so modified that all entries made in good faith up to the time of the passage of this Act have been validated, except entries on reservoir sites which have been selected. The reservoir sites which have been selected are reserved, as under the law of 1888; and the reservoir sites hereafter to be selected are reserved from the date of their selection. In the future, whenever public lands are occupied by claimants with a view to obtaining title, the claimant can obtain title from the Government, under all the land laws, to only 320 acres.

The report of the Conference Committee was agreed to by the House and probably marks out the future course of events. It can be considered under the circumstances as fairly progressive and much can be accomplished. It will, we hope, result in a better knowledge throughout the country of the needs of the West in the direction of irrigation, and thus prepare the way for future undertakings. It is also encouraging to know that the great progress being made in irrigation will be brought out by the new census, as the "number of acres irrigated," and "number of artesian wells," were among the questions on the general agricultural schedule carried by all the enumerators. Before the life-giving waters of irrigation "the great American desert," which occupied so large a place on the maps 30 or 40 years ago, is disappearing, and truly the wilderness is coming to "blossom as the rose."

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$*1,930	$.....
Alpha	6,258	.....
Andes	18,273	.....
Bodie Con	19,219	.....
Benton Con	81,000	.....
Belcher	26,191	.....
Belle Isle	.....	4,798
Best & Belcher	*2,960	.....
Bulwer	4,710	.....
Bullion	10,212	.....
Challenge Con	.....	10,619
Caledonia	5,892	.....
Chollar	.....	†1,203
Con. Cal. & Virginia	.....	‡43,799
Confidence	.....	3,923
Con. Imperial	.....	11,098
Con. New York	8 270	.....
Commonwealth	3,482	.....
Crocker	10,173	.....
Crown Point	.....	†3 006
Del Monte	.....	10,078
East Sierra Nevada	3,089	.....
Eureka	13,270	.....
Exchequer	19,551	.....
Gould & Curry	4,955	.....
Grand Prize	.....	††34,661
Hale & Norcross	.....	†8,075
Holmes	†408	.....
Independence	2,597	.....
Julia	5,865	.....
Justice	†8,815	.....
Kentuck	1,051	.....
Lady Washington	12,636	.....
Locomotive	*799	.....
North Belle Isle	.....	31,140
North Commonwealth	....	14,271
Mexican	10,49	.....
Mono	5,242	.....
Navajo	.....	14,574
Nevada Queen	.....	18 819
Occidental	.....	†4 343
Ophir	34,126	.....
Overman	†52,151	.....
Peer	.....	*917
Peerless	.....	*840
Potosi	.....	5,992
Savage	.....	†2,.94
Scorpion	3,662	.....
Seg. Belcher & Mides	.....	4,381
Silver Hill	9,246	.....
Sierra Nevada	31,665	.....
Silver King	.....	†2,509
Standard	†13,553	.....
St Louis	359	.....
Syndicate	4,302	.....
Union Con	19,728	.....
Utah	.....	4,719
Weldon	.....	1,148

* Collecting assessment.
† Bullion return not received.
‡ Bullion on hand having an assay value of $220,262.60; more bullion to be heard from. Due for royalties to Sutro Tunnel Company, $10,414.50.
†† Bullion on hand, $9,500.

ACCORDING to census reports, San Francisco has 87 92 miles of street-railways, of which 47.22 miles are cables, 27.33 miles animal-power and 13.37 miles steam. San Francisco has more miles of cable-roads than any other city in the United States reported by the Census Superintendent, Kansas City having next with a cable-service of 38.68 miles.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR GOLD MINE.—*Ledger*, Sept. 6: At this mine a material reduction of the working force took place this week. About 40 hands were laid off. The mill is kept running with 20 stamps. The general belief is that it will be kept going on a small scale, while the shaft is sunk to a considerably greater depth, with a view of a more thorough prospecting. Of course the inference to be drawn from this partial suspension is that the output of bullion has not been very satisfactory. Still it is claimed the rock has paid more than expenses so far. A dividend of sixpence per share was declared and paid last month it is said out of the net profits. This is equal to 10 per cent on the capital invested. There are many who think the mine can be made to pay with careful management. E. Dye, the financial manager, returned from S. F. early in the week, and the hands who were laid off were promptly paid the wages due them.

AN IMPORTANT DISCOVERY.—S. G. Spagnoli of Jackson, Daniel Ginvannini of San Francisco and Domenico Baldi of Stockton, have located a marble ledge on Sutter creek, about four miles west of Volcano. This discovery promises to be one of great importance in the development of this county. The stone is said to be capable of a high degree of polish, and almost equal to the finest imported Italian marble, and superior to the Eastern article.

MISCELLANEOUS.—The Grass Valley hydraulic claim is now engaged in the process of cleaning up, and indications point to a big yield. Sidney James is in charge as night watchman. Seven carpenters who have been employed in the construction of the mill on the Gardiner mine, were discharged this week, owing to the near completion of the work. It is thought that 10 stamps will be started inside of two weeks. Col. W. T. Robinson, superintendent of the Sandy Bar Gold Quartz M. Co., has just completed the building of a first-class 10-stamp mill on Sandy Bar, 2½ miles above Big Bar bridge, with free water from the Mokelumne river as a motive-power to drive the mill. The Colonel has been diligently at work for one year developing several quartz ledges in this and Calaveras county, at Sandy Bar. His mill is expected to start up next week.

Calaveras.

WEST POINT.—Cor. Calaveras *Chronicle*, Sept. 6: West Point has appeared quite lively of late. All the mines around here are looking better than ever. Dr. C. H. Beals and W. Ricksnn have some fine mining properties at Railroad Flat. Also James Enright, of the same place, has struck some rich rock in his mine. Railroad will do to keep an eye on, for it is in slate formation and there have been some rich prospects found in that vicinity. The Riverside Co. is preparing its six-stamp mill, which will be ready to run in a few days. They have a large quantity of ore out and a large body in sight which will keep the mill running steady for some time to come. Mr. Watkins has struck a three-foot vein in the old Tucker shaft. It is rich ore.

El Dorado.

HENRY'S DIGGINGS.—Cor. *Mountain Democrat*, Sept. 6: Every one in this locality is well and all are at work, some mining and some prospecting for mines, both gravel and quartz; some are building quartz-mills, some building saw-mills, while others are chopping wood and burning charcoal to supply the wants of the people. Armstrong is at work in his gravel mine and is getting out some good-looking gravel. Hank Roberts has out a big pile of gravel, and is still at work. He will have a big washing by the time the water comes down in the fall. About 18 months ago Sam Lane & Co. located a lot of mining ground near the head of Clear creek, at Russian Diggings, in El Dorado county, and started a tunnel to prospect the hills. At the present time the main tunnel is in 750 feet, and they have gravel almost all the way from 2½ to 3 feet on the bedrock, that will average 2 cents in gold to the pan. There is water on the bedrock and the tunnel lacks 13 feet of being low enough to drain the channel. The gravel is capped over with white lava, and of about the same formation we have at Henry's Diggings where we find our pay. It is well known that the surface ground paid well, and it must have come from the hill. Sam is feeling well over his good prospects, and has let a contract for another 100 feet of tunnel. There is bound to be some good drift diggings found at Russian Hill, as there is a big scope of country in that part of the county that has never been prospected.

Inyo.

DARWIN.—Walker Lake *Bulletin*, Sept. 6: Parties who recently visited this old reliable camp say that a marked improvement in mining affairs there is certain to come soon. The water supply which has been short for a long time will be ample and assured with the new pipe now about all laid. The Defiance mine is said to look better than ever before; more ore in sight and of higher grade. As soon as the water works are completed the men will be transferred to the mine. Jim McDonald is in charge as superintendent, and Geo. H. Hardy, bookkeeper. Other mines will start up with the advent of cooler weather.

Nevada.

IDAHO.—*Tidings*, Sept. 5: The Idaho M. Co. has declared dividend No. 248, of $2 per share, aggregating $6200. Total of dividends to date, $5,265,310. In conversation with Mr. John Coleman a few days ago we were informed that while the outlook at the mine is not very good, the dividends have not yet all been paid.

W. Y. O. D. MINE.—Grass Valley *Union*, Sept. 6: The W. Y. O. D. quartz mine is looking fine on the 700 level in both drifts, showing a good-sized ledge of excellent milling ore. The shaft is being sunk below the No. 7 level, the vein holding regularly as to size and quality.

Plumas.

MEADOW VALLEY.—Greenville *Bulletin*, Sept. 3: Among the important mines of this section is the Diadem, the quartz and placer locations covering 478 acres. The vein has an average width of 55 feet. Most all the stoping done in the mine has been from level No. 2 to the surface. The part of the lode worked does not exceed 110 feet deep, 100 feet along the vein and 12 feet wide, the width of 12 feet being taken mainly from along the footwall. Since the erection of the mill, 10,000 tons of ore have been worked. At the southeast end of the lode, on the Big Creek side, a short tunnel and a crosscut have been run. The ore extracted from level No. 3, 8000 tons, is all on the Eagle Gulch dump, where it is proposed to erect a mill in the near future. On top of the hill, and overlying the lode, existed a gravel channel discovered in 1854 and actively worked, by the drift and hydraulic process, till 1878. From this overlying channel nearly $200,000 was taken out. Most of it was coarse gold. Several placer claims are connected with the property, a timber tract of 160 acres and four miles of ditch furnishing to the mine ample water-power for all purposes eight months in the year. In use are two Huntington mills—one five feet in diameter, the other three and one-half. The ore, however, is soft and easily crushed. The mill is arranged for steam and water power. Messrs. Edman & Malmlund, the principal owners, are putting in a Pelton wheel, which will furnish all the power needed at the present mill-site. The two Huntington mills require only 12-horse power, while the new Pelton will furnish 35. The sulphurets are becoming more valuable than it was ever supposed they would be; hence concentrating machinery will be added this fall. The company has a well-equipped sawmill on the property. Only a small proportion of the ore having been extracted, and the explorations along the vein showing it all to be of good milling quality, this is without doubt one of the best mining properties of the State.

THE MEGOWN MINE, situated about six miles from Spanish Ranch, toward Spanish peak, attracted some attention last year. Generally speaking, the ore is of a decomposed character. Mr. Megown drove a tunnel 308 feet, struck the vein and followed it 100 feet. It is from seven to nine feet thick. The ledge is a regular contact ledge, and it prospects rich. By sluicing off the top, the owner obtained considerable money.

THE CHALLEN MINE is situated on the divide between Spanish Ranch and East Branch. On the East Branch side the prospects in gravel are good, but the bedrock is pitching away. From the Spanish Ranch side a tunnel has been driven in 1100 feet.

OTHER MINES.—The Grub Fat, a placer mine, is owned by Brown & Tucker. They have just finished work for the season. The mine contains a very large body of gravel, and it has paid well. The prospects are now good. The Badger Hill property, east of Spanish Ranch, and owned by L. Jacks, is a rich mine, but it is "enjoined." Nothing but drift and bedrock work is done. The Pine Leaf, owned by Hickman, Wampler & McElroy, is a drift mine being opened up. A bedrock tunnel 800 feet long is now into gravel which prospects well. This will explore an entirely new channel in that part of the country. At Rich Bar, Alex. Buvinghausen has struck good pay in the old Rich Bar lead.

Shasta.

FRENCH GULCH.—Shasta *Courier*, Sept. 6: Capt. Clark & Co. have bought the Gladstone group of mines in French Gulch district for a reported price of $50,000. The purchasers are going to put up a 20-stamp mill, have a force of men at work taking out ore, and others engaged for carpentering, getting out timbers, and road-making. The new company is quite a boomer for French Gulch. Kline's Gulch has about 75 men at work in it, mining. Carlson has half a hundred tons of good ore at the Highland mill, and will have that much more there in a few days that prospects away up.

Sierra.

CHIPS MINE.—Sierra *Tribune*, Sept. 5: Twenty-two men are employed at Chips mine. The 12-stamp mill, which will soon be completed, is to be run by water-power furnished by the Yuba river. No. 2 tunnel is in a distance of 350 feet, and the ledge crosscutted on the 250 feet north and south. No. 3 tunnel, 450 feet lower down the mountain, has been run 400 feet. The vein will be reached in about 450 feet farther. A Burleigh is used in this tunnel. A shaft was also sunk on the ledge 50 feet from No. 2 tunnel. There is no doubt that this mine is going to prove a paying investment for its owners. The management of the mine is in the hands of Sam Locke.

Siskiyou.

SALMON RIVER.—Cor. Siskiyou *Telegram*, Sept. 6: The Know-Nothing quartz mine, superintended by Mr. Lewis Bevan, is employing nine men at present and it is the expectation that the force will be considerably increased in the near future. Some very good ore is being taken out now and ere long the company's four-stamp mill will resume operations. The Gold Run M. Co., A Dannenbrink, superintendent, have nine men at their mine and a four-stamp mill, extracting and crushing rock of a very fine quality. The Rising Sun quartz mine, J. Riley, superintendent, is being developed as fast as possible with the small force employed. The Hansen mine, the pioneer quartz mine on Know-Nothing creek, on which operations have been suspended for the last six months, has again assumed a working appearance, and ere long will be back to the ranks of a million-producing property again.

DEEP DIGGINGS.—Yreka *Journal*, Sept. 10: Messrs. Al Lash, E. A. Parlin and Wm. Bennett, formerly in the employ of Cooper, the contractor, have been at work sinking an open cut down to bedrock on Greenhorn creek, where they anticipate taking out rich pay in a short time, being now almost down to the pay streak. They keep the cut pumped out through means of a large steam pump worked by Scheld's Westinghouse engine, and expect to reach bedrock at a depth of 80 feet. These deep diggings on Greenhorn have never been opened on account of water, but all the ground worked in days past on this creek has paid exceedingly rich, and there can be no doubt of success being realized in the above-mentioned effort. Ah Giddings and Wm. Smith have some very rich mines on Hungry creek, Siskiyou mountain, only partially developed this season. They expect to do well when the first rains come, and during the winter and spring seasons.

Trinity.

THE GLOBE MINE.—*Journal*, Sept. 6: The Globe quartz mine, owned by Tighe, Weyand, Meckel and Everhart on the head of Owens creek is showing up well, although no depth has yet been attained on the vein. It has been traced for about 1200 feet and has been cut and prospected in many places in that distance. The ledge runs from 18 inches to 4 feet in width and is of high and even grade. The owners are satisfied with their prospect, feeling confident that they have a valuable property.

NEVADA.

Washoe District.

MEXICAN.—Virginia *Chronicle*, Sept. 6: 1465 level. The upraise started in the east crosscut No. 1 at a point 32 feet in from the north drift has been carried up during the week 13 feet (total hight, 30 feet), passing through porphyry which carries quartz of very low assay value.

OPHIR.—1300 level. The winze going down from this level has been sunk during the week 19 feet and connected with an old east crosscut, which we have been reopening on the sill floor of the 1465 level.

CON. CALIFORNIA & VIRGINIA.—There has been extracted during the week from all parts of the mine 739 tons of ore, which has been shipped to the Eureka mill. The average assay value of all the ore worked at that mill during the week (960 tons) was $22.11 per ton. During the last four days of the week the work of extracting ore was stopped for the purpose of making necessary repairs to the shaft machinery, and there was a loss of three days in the running time of the Eureka mill, which also was needing some repairs. Operations in the mine will be resumed next Monday. Bullion shipped to Carson Mint, assay value, $35,871.72.

SAVAGE.—During the week we have hoisted 558 cars of ore; shipped to the Rock Point mill 446 tons and milled 455 tons; average assay, $20.34. Bullion on hand, $37,000.

BEST & BELCHER.—On the 1200 level raise No. 1 is carried up 11 feet. Total hight, 40 feet. Formation, clay and porphyry.

SEG. BELCHER.—The winze below the 1300 level is in promising looking quartz carrying a small amount of metal.

POTOSI.—Bottom of the winze below the 930 level continues in porphyry and quartz.

CHOLLAR.—Regular shipments of ore about the same as last week in both quantity and quality.

CHALLENGE CON.—The joint Confidence, Challenge and Imperial west crosscut No. 2, 1000 level, is in 410 feet, 26 feet having been added, the face in porphyry.

CROWN POINT.—The 300 east stope is growing constantly narrower as it is opened north and south, and the grade is lower. Most of the ore extracted is now coming from the 300 west stope, and is composed principally of old fillings, which require careful assortment. Shipped to the Mexican mill during the week 541 tons, 1260 pounds of ore, the average battery of which was $15.03.

OVERMAN.—Extracted from 1200 level 324 tons and 1600 pounds of ore. Car samples average $17 per ton. Shipped to the Brunswick mill 302 tons and 1760 pounds of ore. Battery assays average $19.57 per ton. Of this amount, $12.78 per ton is in gold. For the month of August hoisted from the 1200 level 1641 tons of ore; average of car samples, $15.21 per ton. Shipped to the Brunswick mill 1604 tons of ore; battery average, $17.55 per ton, of which $10 is gold.

BELCHER.—The understope from the 100n level looks poor so far, but contains spots of good ore that encourage further prospecting. There is no change to report of the 300 stope. Shipped to the Vivian mill during the week 306 tons, 1030 pounds of ore, the average battery of which was $23.99.

IMPERIAL CON.—West crosscut No. 3 from the 500 foot north lateral drift is out 202 feet, having been advanced 19 feet, the face in porphyry. The south lateral drift from top of the raise on the 450 level is in 210 feet, 10 feet having been added; the face shows quartz having no value. West crosscut No. 3 from 750 north lateral drift is out 438 feet, 20 feet having been added, the face in porphyry.

JUSTICE.—Shipped to the mill during the week 188 tons, 850 pounds, the average battery of which was $36.04 per ton.

CONFIDENCE AND CHALLENGE.—The joint Imperial west crosscut No. 2, 1000 level, is out 300 feet with its face still in quartz showing little or no value.

ALTA.—The northwest drift on the 725 level still following a very promising streak of fair grade ore about a foot in width. The northwest drift on the 1000 level continues cutting stringers or feeders of good ore. The average assay of the ore extracted from the regular stopes is $24 per ton.

YELLOW JACKET.—About 600 tons of ore per week is shipped to the mill from the regular ore stopes, sample assays showing an average of about $22 per ton.

EXCHEQUER.—The east crosscut on the 500 level has its face in porphyry with clay seams.

OCCIDENTAL.—Extracting fair grade ore from the stopes on the 450 and 500 levels.

Cottonwood District.

NICKEL AND COBALT.—*Silver State*, Sept. 5: James Hendra, Jr., who arrived yesterday, says two companies are working the nickel and cobalt mines in Cottonwood, just over the county line, and there is a prospect of another company starting in a few days. Charles Bell has a large quantity of ore out and is getting material on hand to erect a furnace. George Lovelock, Sr., has organized a company which is working the mines.

ARIZONA.

GOOD ORE. — Prescott *Journal-Miner*, Sept. 3: The Howard mill, on the Hassayampa, continues to run on good ore. The Crowned King mine has 30 tons of concentrates now awaiting shipment. Work is progressing rapidly on the new roasting works being erected in Copper basin. The Skull Valley mill continues to run successfully. Mr. Rubert says the property is turning out far better than he anticipated. With the new and powerful hoist now being put up at the Congress they will be able to sink the shaft to a depth of 2000 or 3000 feet. Mr. Shekels of the Crowned King mine is expecting a lot of new machinery for their mill, which will be put up on its arrival. Owing to the heavy rains in the Black Hills and the consequent washing of the roads, the United Verde smelters have been running very light during the month of August. Teamsters have found great difficulty in moving. Roads have been put in repair, however, and teams are again moving on time. E. Burgess, who has been negotiating with Baltimore capitalists for the sale of the Tiger mine, received a telegram this morning stating that a company has been organized there and the stock taken, and work will be commenced immediately developing the mine. The property is one of the most promising in the Territory, and has already yielded a large amount of silver bullion.

MOHAVE NOTES.—*Miner*, Sept. 6: C. E. Sherman will soon commence work on the Independence at Chloride. He is putting up a new whim and getting things in shape to do considerable work before the year ends. Rogers, Shippey and Shearick, who have a lease on the Altatta dump, have between four and five carloads of ore on the way to the sampling works. Henry Matsen is in from Ivanpah with three tons of rich rock. A strike was made on the Nellie Bly mine in Wallapai mountains, by Wm. Morrison, who has a lease on the mine from the owners, W. A. Neal and T. A. Groin. A three-inch streak, which assays 800 ounces in silver and a two-foot streak which assays 80 ounces have been struck. Conkey & Brandon have thrown up their lease and bond on the Tuckabo mine. The sinking of the shaft on the Empire mine is now progressing at the rate of three feet a day. Messrs. James & Eames, who have purchased a number of mines in the neighborhood of Todd basin and Cerbat, have decided to build a five-stamp mill at the junction of the Todd and Union basin roads. The mill will be a complete one and work on the foundation has already been commenced. Mr. Eames has gone to California for the machinery.

COLORADO.

RIVER MINING.—Denver *Republican*, Sept. 4: Cass Hite, the veteran prospector of the Colorado canyon, came up from Dandy Crossing yesterday and registered at the Brunswick. Mr. Hite did not particularly desire to talk for publication, but he gave information of several large deals pending for the operation of the rich placer fields near Dandy Crossing. "Four new companies will commence operations in that vicinity this month," said Mr. Hite. "Thomas Lyle and a friend named Anderson will invest a good round sum in the development of the fields about 20 miles above the mouth of the San Juan. Mills, Haskell & Co. will also handle the fields 18 miles below, near the crossing. A party of Denverites is negotiating for the Good Hope bar, which averages about 60 cents per yard. Another syndicate is after the Tickahoo bars. Tickahoo is the Indian name for friend. A Chicago syndicate will also, in all probability, organize for investment at Dandy Crossing. I had the honor of naming Dandy Crossing, and I will tell you why I gave it the name it bears at present. It is the only wagon-road crossing for a distance of 400 miles in the Colorado canyon. It is 120 miles from any railroad. It is a picturesque spot with a labyrinth of canyons all around it, and I at once appropriated the name of 'Dandy' to it. The prospecting in the vicinity of the canyon is rather difficult to make, but I am satisfied that great wealth abounds along the towering walls of the Grand canyon. At present, down our way, the upper stream of gold comes from Gold creek. It has been prospected in places for a width of one mile. The Colorado river is heavy in rich gold bars. Rich discoveries have recently been made at the head of the placers by Jack Butler, Sumner and others. I think candidly that the Colorado placer fields are the most valuable in the United States. The gravel's lowest yield is 20 cents per cubic yard; its highest average is 45 cents per cubic yard. You may think that Dirty Devil is an odd name for a river, but that is the name of one of the streams down our way. It is about 200 miles long and will also develop good deposits."

IDAHO.

THE GOLD BELT.—Wood River *Times*, Sept. 6: Henry Donovan, the well-known mining man, went East to-day, to organize two companies to operate on the Gold Belt. As a preliminary step thereto he has succeeded in purchasing, for cash in hand, two of the most promising groups of prospects on the Gold Belt. One of these is known as the Rowley group. It consists of five claims located on Trail creek, in Little Smoky Mining District, about 3 miles from Willow creek, and about 1½ miles from the Fannie Waring mine. About $800 worth of development work has been done on the claims, and a vein carrying 9 to 13 feet of free gold ore assaying from $11 to $60 per ton, crops out boldly along all of the five claims. The other group consists of the Old Faithful, Mahel and Alta claims, situated on Willow creek, close to the old Vallandigham station, in Mineral Hill Mining District, and adjoining the valuable mines owned by Col. and Judge Donophan, of the Camas No. 2. The development work on these claims shows a well-defined vein carrying from 9 to 11 feet of free milling gold ore assaying from $13 to $160 per ton. These properties are among the choicest in Idaho, and require only the intelligent expenditure of a reasonable amount of money to make them dividend-paying propositions.

LOWER CALIFORNIA.

ALAMO.—*Lower Californian*, Sept. 4: W. E. Howard and John Albright of the Montezuma mine have formed a partnership with George Blethen, whereby the 5-stamp mill in Mexican Gulch will be moved over and set up on the Montezuma at once, and thus another important industry added to Alamo. The mill for its size will be the finest in camp. The large pump and boiler at the San Nicholas mine, Real del Castillo, has been bought and will be hauled up here next week to drain the Montezuma. The building for the Princessa Co.'s new mill is ready for occupancy. New buildings are being put up in various quarters. The camp is perfectly healthy and booming. The Princessa Co. is working the vein in the Ulises which was such a rich strike to the former contractors, the Newell brothers. The owners of the Aurora mine are jubilant over their property. It is at present probably the richest mine in operation here.

MONTANA.

REOPENING.—Anaconda *Review*, Sept. 6: Since the fire in the St. Lawrence has been extinguished, the work of reopening that mine and the Anaconda has been progressing as rapidly as possible, and the managers assert that the great properties will soon

be producing ore again. In the mean time the work of improvement on the smelters is being rushed, and before the holidays the Anaconda smelters will have a capacity of 3000 tons daily. The new furnaces are being completed as rapidly as possible, and the frame for the new iron building is being raised. The Alice company is following the example of its rivals, and the Alice mine is undergoing extensive repairs and improvements. The Wickes smelter is to resume operations at once, and the miners in that district are pleased with the prospect, as they have been obliged to ship their ores to East Helena. They can now have them treated at home.

ENLARGING THE SHAFT.—Butte *Miner*, Sept. 4: The work of enlarging the Gagnon shaft from a two-compartment to a three-compartment from the 600-foot level to the surface was commenced yesterday afternoon, and will be rushed as fast as three shifts of stalwart rock-breakers can accomplish it. Crews of men were put on at each 100-foot level. Below the 600-foot station the shaft is three-compartment. The size of the upper 600 is being enlarged to admit of the placing of the large hoisting machinery which has already been ordered for the property. With the present condition of the shaft the ore and waste have to be handled twice, once at the 1000-foot level and again at the 600, but the change will necessitate handling only once, which will be a great saving and convenience to the company.

NEW MEXICO.

CORA MILLER.—Silver City *Enterprise*, Sept. 6: Ten tons of ore were shipped last Sunday from the Cora Miller mine on the Mangus. The ore averages over 100 ounces per ton. The mine is owned by the Mangus Mining Co. The company will hereafter accumulate ore on the dumps instead of shipping, and when enough is on hand and developed in the mine to warrant it, a mill will be built. The Alhambra Co. of Alhambra (formerly Black Hawk) last Monday shipped three tons of ore which will average over $5000 per ton and may run as high as $8000 per ton. Ten stamps of the Pacific mill are now dropping on regular time.

OREGON.

PROSPECTING.—Jacksonville *Times*, Sept. 6: Considerable prospecting is now going on in Southern Oregon. Thirty tons of quartz from the Spence mine near Yreka recently yielded $3230 in gold. Reuben creek miners have all done well this season and made big wages, says a correspondent. The ore now being taken out at the old Swinden mine promises so well that the parties who are working it are having it sacked. Work is still being continued at the old Gold Hill mine under the supervision of E. Sanderson Smith, the mining expert, and it is reported that the prospects for a rich strike are much better than ever. The Goff & Chapin hydraulic mine in Josephine county has been bonded by the owners to Portland parties for $10,000. The same parties expect to secure options on several other mines in that section. Philip Mullen of Steamboat was here on Wednesday, from whom we learned that work is progressing on the shaft of the mine controlled by E. S. Smith as rapidly as possible, and that the prospects are good. San Francisco capitalists and mining experts have bonded the group of copper mines near Waldo, with the intention of soon developing same, and possibly constructing a railroad to the main line to transport the ore, which is very rich, assays showing 40½ per cent of copper.

UTAH.

ORE SHIPMENTS.—Park *Record*, Sept. 6: The ore shipments this week aggregate 1,819 540 pounds, or nearly 910 tons. It is expected that the ledge in the Alliance will be cut by the tunnel in a very short time. The ore showing in the new workings of the old McHenry mine is constantly improving. A force of 21 men is employed at the Woodside. The Nevada-Northland leasers' mine appears on the list of shippers this week. A force of 20 odd men is employed in the mine and a big lot of stoping ground has been opened up. It is currently reported that operations will be resumed shortly on the Wilson and Barrett property which adjoins the McHenry on the west. Messrs. Holden, Kirby and Morse, the Colorado smelting and mining operators, left for their homes last evening. They are so well pleased with the workings of the Russell leaching or lixiviation process here that they will at once have a Russell plant erected at Aspen, having been convinced of the adaptability of the new process for their Aspeo ores.

WASHINGTON.

PAYING DISTRICTS.—Seattle *Press*, Sept. 6: The interest taken in mining in Western Washington is constantly increasing. Some good paying districts are being opened up and there is considerable activity in prospecting. Old miners and prospectors who have withdrawn from the business are again attracted because of the recent finds to their old vocation, and are now deeply interested as in former days, when such districts as the Fraser attracted thousands of miners in a few months' notice. Not only is considerable attention being given to the Silver creek, the Sultan river, and the Snoqualmie districts, but also to the Olympic mountains. The *Press* exploring party advertised this region far and wide, and since the party's explorations many parties have been organized and peoetrated the formerly unknown, and in no few instances report deposits of valuable mineral ores. Development of the mineral resources of the Silver creek and Sultan districts is constantly progressing, but is retarded to no little extent, owing to the lack of facilities for ingress and egress and ore traosportation. Mr. S. G. Dewsnap, an experienced miner, thoroughly familiar with and greatly interested in the Silver creek district, was seen yesterday by a *Press* representative and said that a discovery of a veio of antimonial silver was recently made in the northeast part of the heli, and is making a very good showing. The Silver creek district io which mining locations have already been made, consists of a belt of about five miles long and three miles wide. The veins are well-defined and regular. Miners are doing their assessment work on the different veins, and wherever they are exposed some very good showings are made,

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 2, 1890.

435,785.—GATE—Jos. Albers, Corvallis, Or.

435,553.—KNIFE-SHARPENER — J. S. Blood, Napa, Cal.

435,622.—ORE-CRUSHER—John M. Bryan, S. F.

435,556.—SAW-BIT HOLDER—S. H. Chase, San Jose, Cal.

435,557.—CHIMNEY—L. E. Clawson, S. F.

435,561.—CLOTHES-DRIER—F. Frank, Suisun, Cal.

435,562.—CONCENTRATOR — Geo. Gates, Drytown, Cal,

435,563.—PLATE-LIFTER—D. B. James, S. F.

435,840.—SOLDERING-CAN BODIES—M. Jensen, Astoria, Or.

435,651.—FRUIT-STONER—P. Maisonneuve, Oakland, Cal.

435,569.—INSECTICIDE—W. Mann, Fresno, Cal.

435,567.—GANG-PLOW FRAME—A. F. McMillan, Benicia, Cal.

435,854.—DECORTICATING MACHINE — J. L. Notley, Santa Cruz, Cal.

435,462.—YARN-WINDER—J. A. Shepard, Fossil, Or.

435,592.—JOURNAL-BEARING — F. H. Smiley, San Jose, Cal.

The following brief list by telegraph for Sept. 9 will appear more complete on receipt of mail advices:

California—Thomas B. Craycraft, Pooocho, waterway and gate for reservoirs; Ferdinand Fraok, Suisun, sash-holder; John Cluty, San Diego, pipe coupling and expanding metal le sleove; R. H. Sinclair, Alameda, assignor to the Sinclair Manufacturiog Company of California, windmill; William Stephens, Santa Rosa, electrical traction apparatus; George H. Tucker, San Francisco, die for making lathing; Stefano di Vicchio, San Jose, and J. Mignola, San Francisco, refrig rator.

Oregon—Lewis J. Bergondahl, assignor of two-thtrds to Mr. Taylor, Pendleton, Or., and J. Gagen. Port Townsend, Wasb., snow-plow; Thomas P. Madill, Albany, fence making machiue; Charles W. Freuain, Portland, steam ore stamp.

Washington—Jane Ford, Ross Station, steam cooker; Peter E. Frost and L. A. Connor, gaff point for vessels.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CONCENTRATOR.—George Gates, Drytown, Amador county. No. 435,562. Dated Sept. 2, 1890. This is an improved apparatus for separating fine, heavy, valuable substances and sulphurets from the coarser sand, gravel and gangue, so as to concentrate and save the former and allow the latter to pass off. It consists of a series of tables with peculiarly arranged supply and distributing devices, which cannot well be described briefly without the aid of engravings.

GANG-PLOW FRAME.—Alfred F. McMillan, Benicia, assigoor to the Benicia Agricultural Works. No. 435,567. Dated Sept. 2, 1890. In the coostruction of gang-plows it is customary to unite the beams together by means of iotermediate strips, braces, or plates of iron, which are bolted through the sides of the adjacent beams by bolts or nuts; but with the strains which ordinarily are brought upon the plow frame through the plows, which are supported from each beam, these braces become loosened and the frame loses its rigidity. This improved frame is especially applicable to that class of plows having two or more parallel iron beams to each of which a plow is conoected. The patent consists in the combination with the beams of a gang-plow, of diagonal plates extendiog across the beams in pairs, one above and one below, with spurs or projections fixed in the beams and extending into corresponding cavities in the bars, with bolts and outs whereby said nuts are clamped to the beam.

CLOTHES-DRIER.—Ferdinand Fraok, Suisun, No. 435,561. Dated Sept. 2, 1890. This rack for drying clothes consists of an arraogement of telescopic tubes having transverse openings made io them to receive rods or bars upoo which the clothes are suspended, and a means for suspeoding the device and raising and lowering it.

CONTINUOUS SECTIONAL CHIMNEY.—Leooard E. Clawson, S. F. No. 435,557. Dated Sept. 2, 1890. This continuous sectional tube or chimney consists in the combioation of an inner tube made io sections of earthenware having the adjaceot eods made one with a flange aod the other adapted to fit therein, an exterior sheet-metal tuhe of sufficient diameter to fit around the flanges of these joints, a filling of plastic material which will set and become hard, a band surrounding each joiot and having lugs which form guides for a second exterior metal tube which provides an air space between the two. It also consists in the base for the support of said chimney raised so as to provide an air space beneath this base and between the chimoey and the floor upon which it rests.

KNIFE-SHARPENER.—Joel S. Blood, Napa City, assignor of one-half to Emanuel Manasse. No. 435,553. Dated Sept. 2, 1890. This ioveotion relates to that class of devices for sharpening knives in which opposing cooverging steel edges are used, between which the knife-blade is drawn, and especially to that sub-class in which the edges are those of steel disks or plates mounted axially upon a stock and adapted to be adjusted to present fresh edges when required and fixed in the positions to which they are adjusted. The object of this invention is to provide a simple aod effective knife-sharpener, the disks or plates of which are formed with improved sharpening edges projecting from their peripheries and adapted to be successively brought into use as required.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alki Cons M Co	California	1	1	Aug 28	Oct 3	Oct 22	B B Keeler, Flood Building
A la M Co	Nevada	39	10	Sept 1	Oct 7	Oct 28	L Osborn, 309 Montgomery St
Best & Belcher M Co	Nevada	47	25	Aug 21	Sept 25	Oct 17	L Osborn, 309 Montgomery St
Gray Eagle M Co	California	19	6	Aug 25	Sept 29	Oct 20	J M Buttington, 323 California St
Guascarao & California M Co.	Honduras	2	10	Aug 12	Sept 20	Oct 8	E Oliver, 222 Montgomery Ave
Humboldt M & M Co	Nevada	1	1	Aug 16	Sept 29	Oct 25	J C Ruddock, 35 New Montgomery St
Kentuck M Co	Nevada	22	30	Aug 18	Sept 22	Oct 14	J W Pew, 310 Pine St
Lexoo Ifre M Co	Arizona	8	5	Aug 13	Sept 18	Oct 8	A H Fish, 309 Montgomery St
Live Oak Drift Gravel M Co	California	12	5	Sept 3	Oct 9	Oct 31	J Morizio, 328 Montgomery St
Mayflower Gravel M Co	California	48	20	Aug 5	Sept 6	Sept 29	J Morizio, 328 Montgomery St
Mineral Klug M Co	Arizona	5	50	July 31	Aug 30	Sept 22	
Occlental Cons M Co	Nevada	7	28	Aug 5	Sept 11	Oct 7	A K Durbrow, 309 Montgomery St
Peer M Co	Arizona	9	10	Aug 7	Sept 12	Oct 3	N T Messer, 309 Montgomery St
Peerless M Co	Arizona	15	15	Aug 14	Sept 23	Oct 14	A Waterman, 309 Montgomery St
Teresa M Co	Mexico	2	5	Aug 11	Sept 18	Oct 8	A Cheetham, 328 Montgomery St
True Cons M Co	California	9	2	May 26	July 21	Sept 15	J C Bates, 434 California St
Union Cons M Co	Nevada	41	28	July 21	Aug 26	Sept 15	A W Barrows, 303 California St
Utah Cons M Co	Nevada	10	25	Aug 5	Sept 15	Oct 2	A H Fish, 309 Montgomery St
Weldon M Co	Arizona	3	10	Sept 3	Oct 0	Oct 30	A Waterman, 309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F	MEETING	DATE
Gra d Prize M Co	Nevada	R R Grayson	327 P ne St	Annual	Sept 16
Gray Eagle M Co	Nevada	A W Barrows	303 California St	Annual	Sept 17
Mono G M Co	California	E L Burling	309 Montgomery St	Annual	Sept 18
San Joaquin Valley Coal M Co	Cal.	F Bonnuchia	428 California St	Annual	Oct 1

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	05	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	April 10
Derbec Blue Griv I M Co	California	T Wetzel	522 Montgomery St	10	May 16
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 11

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 11, 1890.

Holidays the past week interrupted general trade, but now business is resuming its wonted sway. The city is crowded with interior merchants who are sampling along the line preparatory to buying.

The local money market is easy. Remittances are free, much more so than at this time in 1889, while the call for accommodations is lighter. Country realty is advancing quite rapidly, under a renewed inquiry for small farms by new-comers. The heavy purchases of U. S. bonds by the Treasury is a contributor to the general ease. Considerable were sold on this coast. The total purchases will aggregate $50,000,000.

The steamer Oceanic for China, took out the following treasure: To China, Mexican dollars, 72,165; gold coin, $35,157; gold dust, $720; currency, $815; total, $108,867. To Japao, the steamer took out 56,000 Mexican dollars.

The last steamer from Australia brought in $500,000 in English gold coin. It went into the miot for recoining.

MEXICAN DOLLARS—The market is dull at 92@92½c. A large demand is expected to set in with the return of Chinamen from farm work. When silver bullion was the highest, some Mexican dollars were melted and sold to the Government as bullion.

SILVER—The market abroad and at the East set back the past week, which goes to show that the present silver law is far from satisfactory. The necessity of remonetizing silver by passing a free-coinage Act is made apparent by the speculative action of the metal. Owing to the festivities the past week, purchases of silver, if any, by the Department were lost sight of—oot telegraphed; consequently we cannot give them in this issue.

QUICKSILVER—Receipts the past week aggregate 335 flasks, and exports hy sea 300 flasks to China. The market is steady, with a firm tone.

LIME—Receipts the past week aggregate 2385 bbls. The demand, both home and export, is light.

BORAX—Receipts the past week aggregate 2075 ctls, and exports by sea 1184 lbs. to Japan. The market is steady under a good Eastero inquiry.

LEAD—The market is very strong at another advance. The combinations at the East appear to be forcing prices up.

TIN—European and Eastern markets have advanced. The higher range is due to confirmed reports of a lessened output of straits, which brought both speculators and consumers into the market.

COPPER—The market holds to strong prices. Europeao statistics show that the visible supply in England and France decreased nearly 2600 tons last month, with a decline of 2350 in the quantity of fine copper held io Eogland, the most noteworthy change. The deliveries were 1900 tons less and the supplies received 2400 tons less thao in Septemher last year.

IRON—Imports the past week aggregate 600 toos pig from Iroodale. The market retains the steady tone heretofore noted, under a fair demand and gradual lesseoing stock. English and Eastern advices report more active markets, with furoaces generally well sold ahead.

COAL—Imports the past week aggregate as follows: Naoaimo, 1476 tons; Seattle, 2002; Tacoma, 13,610; Comax, 4300; Newcastle, N. S. W., 2234; Departure Bay, 2480; total, 26,039 tons. The market holds to full prices. Although there is a good demand, yet it does not appear to be quite so sharp. The late scare about short supplies caused many consumers to purchase ahead. It oow looks as if the Australian shipments will not be interrupted, while Englaod will increase her shipments to this port. The Wellingtoo collieries will soon hegin to put out their regular quota. Other coast collieries' output is larger.

Eastern Metal Markets.

By Telegraph.

NEW YORK, September 10.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	54⅜	1 17½	$17 00	$4 82½	$22 10
Friday	54	1 10½	17 00	4 87½	22 20
Saturday	54	1 10⅜	17 00	4 92½	22 15
Monday	53⅜	1 16½	16 85	4 95	22 25
Tuesday	53⅜	1 16½	16 85	4 92½	22 25
Wednesday	53⅜	1 17	16 90	4 92½	22 25

NEW YORK, September 10.—Quicksilver steady; 75@76c last. London, Rothschild prices, £10. Borax, demand moderate; no higher. Copper, demand moderate. Lake ingot, 16⅞@17c; Arizona, 15¼@15⅝c; casting, 14¼@14⅝c. Pig Lead is higher; 1000 tons, $4 80; closing prices, $4.85@4.90.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug 21.		WEEK ENDING Aug. 28.		WEEK ENDING Sept 4.		WEEK ENDING Sept. 11.	
Alpha	1.10	1.20	1.15	1.30	1.10	1.20	1.20	1.30
Alta	1.05	1.15	1.05	1.20	.90	1.15	1.05	1.15
Andes	.50	.75	.70	1.20	1.10	2.35	1.10	1.35
Belcher	2.80	3.00	3.05	3.30	3.15	3.45	3.05	3.25
Best & Belcher	2.85	3.15	3.15	3.50	3.20	3.70	3.40	3.55
Bullion	2.20	2.70	2.70	3.10	2.35	2.75	2.50	2.75
Bodie Con	.95	1.30	1.25	1.50	1.20	1.40	1.20	1.25
Bulwer	.20	.25	.25	.30	.25	....	.25	....
Commonwealth	2.50	2.70	2.55	3.05	3.00	3.10	3.00	....
Con. Va. & Cal	4.55	4.15	4.05	5.00	4.50	4.95	4.70	4.85
Challenge	2.15	2.20	2.20	2.40	2.20	2.30	2.25	2.70
Chollar	2.45	2.10	2.70	3.15	3.10	3 3	3.10	3.40
Confidence	5.00	....	5.10	5 5.	5 37	....	5.50	5.70
Con. Imperial	.30	.40	.40	....	.40	....	.35	.40
Caledonia	.30	....	.35	.45	.45	....	.40	.50
Crown Point	2.45	2.60	2.65	2.80	2.65	2.85	2.70	2.85
Crocker	.20	....	.15	.25	.20	.25	.20	....
Del Monte	....	....	1.20	....	1.20	....	....	....
Eureka Con	4.00	4.20	4.50	4.90	....	....	....	....
Excheqner	.75	.90	.85	.95	.90	1.00	.95	1.05
Grand Prize	.30	....	.25	.35	.30	....	....	....
Gould & Curry	1.85	2.30	2.25	2.45	2.15	2.45	2.25	2.30
Hale & Norcross	2.15	2.60	2.45	2.95	2.35	2.70	2.45	2.65
Julia	.20	.25	.25	.30	.25	.30	.30	.35
Justice	1.30	1.35	1.35	1.40	1.40	....	1.45	....
Kentuck	.90	1.00	.90	1.00	1.15	1.50	1.30	1.55
Lady Wash	.30	.37	.30	.40	.45	.70	.60	.75
Mono	.40	.45	.60	.70	.50	.60	.55	.60
Mexican	2.85	3.20	3.10	3.40	3.05	3.45	3.15	3.35
Navajo	....	....	....	....	.40	.45	.30	.40
North Belle Isle	1.05	....	1.10	....	1.05	1.15	1.00	....
New Queen	....	....	.75	1.00	.90	....	.75	.80
Occidental	.80	.90	.95	.90	1.00	1.00	1.00	1.35
Ophir	4.10	4.75	4.65	5.25	4.75	5.25	4.85	5.12
Overman	1.90	2.20	2.10	2.25	2.15	2.15	1.15	2.25
Potosi	5.50	6.10	6.12	7.35	6.00	6.62	6.25	7.25
Peerless	.10	.10	.10	....	.10	....	.10	....
Peer	.10	....	.10	.50	.15	1.00	.35	.45
Savage	3.40	4.30	3.85	4.20	3.65	4.25	3.75	3.90
S. B. & M	1.20	1.30	1.25	1.50	1.35	1.50	1.30	1.40
Sierra Nevada	2.55	2.75	2.65	3.15	2.80	2.90	2.75	2.85
Silver Hill	.25	.30	.25	.30	.30	.40	.35	....
Scorpion	....	....	.25	.25	.25	.30	....	.30
Union Con	2.25	2.50	2.85	3.1	2.80	3.40	2.85	2.95
Utah	.60	.65	.65	.80	.75	.85	.75	1.05
Yellow Jacket	3.40	3.20	3.15	3.50	3.25	3.40	3.25	3.40

* Assessment de inquent.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, September 11, 1890.

ANTIMONY	—	@ 22
BORAX—Refined, in carload lots	8	@ —
Powdered " "	8	@ —
Concentrated " "	7½	@ —
All grades jobbing at an advance.		
COPPER—		
Bolt	23	@ 25
Sheathing	23	@ 25
Ingot, jobbing	20	@ —
do, wholesale	18	@ 18½
Fire Box Sheets	23	@ 25
LEAD—Pig	—	@ 5
Bar	7	@ —
Sheet	7	@ —
Pipe	9	@ —
Shot, Mount 10% on 500 lbs bags Drop, ₰ bag.	1 70	@ —
Buck, ₰ bag	1 90	@ —
Ubilled, do	2 10	@ —
QUICKSILVER—By the flask	56 00	@57 00
Flasks, new	—	@ —
Flasks, old	45	@ 55
TIN—Pigs—B. Y., steel grade, 14x20, to arrive.	—	@ —
B. Y., steel grade, 14x20, spot	4 80	@ —
Charcoal, 14x20	6 75	@ 7 00
do roofing, 14x20	6 00	@ —
do, do, 20x28	12 00	@ —
Pig tin, spot, ₰ lb	22½	@ —
CHROME IRON ORE, ₰ ton	10 50	@ —
IRON—Bar, base	3	@ 3½
Norway, base	4½	@ 5½
STEEL—English, lb	16	@ 20
Canton tool	9	@ 9
Black Diamond tool	9	@ 9
Pick and Hammer	8	@ 10
Machinery	4	@ 5
Toe Calk	4½	@ —

	Spot.	To Load.
IRON—Glengarnock ton	34 00 @—	30 @ —
Eglinton, ton	34 00 @—	30 @ —
Imperial Soft, No. 1, ton	@32 00	30 @ —
Oregon Pig, ton	@33 00	— @ —
Puget Sound	34 00 @—	— @ —
Bar Iron (base price) ₰ lb	— @ —	— @ —
Clay Lane White	@28 00	25 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Langloan	34 00 @—	30 @ —
Thorncliffe	34 00 @—	30 @ —
Gartsherrie	34 00 @—	30 @ —
Barrow	34 00 @—	30 @ —
Thomas	33 00 @—	— @ —
Cargoheet	30 00 @—	26 @ —

Coal.

TO LOAD—PER TON	SPOT FROM YARD—PER TON.	
Australian	$ 8 00@$ 8 50	Wellington $ 9 50
Liverpool St'm	8 00@ 8 25	Greta 11 10
Scotch Splint	8 25@ 8 50	Carbon Hill 7 50
Cardiff	8 50@— —	Nanaimo 9 50
Lehigh Lump	16 50@17 00	Gilman 8 50
Cumberland bk	13 50@— —	Seattle 8 50
Egg, hard	15 00@— —	Coos Bay 8 50
CANADIAN ANTHRACITE COAL		Cannel 12 00
Egg, ship side	$12 50	Egg, hard 16 00
Egg, yard	16 00	Cumberland, in sacks 16 00
Stove, yard	15 00	do, bulk 15 00
Nut, yard	15 00	Wallsend 10 00@10 50
	COKE.	
English, to load		$12 00@13 00
English, spot, in bulk		13 50@15 00

MECHANICAL PROGRESS.

Increasing Use of Structural Iron.

Probably the best idea of the immense progress which is being made in the use of structural iron and steel may be formed from the announcement just made that several iron-brokers have just organized a company capitalized at $5,000,000 for the manufactnre of structural iron to be used in buildings, bridges, ships, etc.

The plant will probably be located in or very near to Chicago. Although of very recent growth, the demand for this kind of iron, or steel, rather, is enormous. The quantity needed for a large modern building would be equal to half a hundred miles of rails for a railroad. Architects and owners have passed favorable criticism upon steel structnres, and it is believed the demand will increase. The prediction is made that structural iron will soon be used in smaller buildings, as residences, flats, etc.

Steel-makers are rapidly becoming aware of the character which structural metal should possess, and nearly every day some new feature of special excellence and value is revealed. Some time ago it was announced in the French papers that a system of building houses of steel plates had been introduced hy Mr. Danly, an iron manufacturer in France, and that it had received a fair degree, first of interest, and then of public approval.

Mr. Danly satisfactorily ascertained that corrugated sheets of steel, no more than a millimeter in thickness, are sufficiently strong for building houses several stories high, and the material used allows of quite a variety of architectural ornamentation. The plates thus employed are of the finest grade of structural steel, and galvanized after they have been cut to proper shapes and sizes, so no portion of them is subject to atmospheric exposure. In a sanitary sense such houses are deemed very satisfactory and capable of being thoroughly ventilated and heated.

The exportation of iron houses is becoming an important business in England. Of course they would be better if made of steel, but the class of persons for whose homes they are designed prefer cheapness to superiority, and hence iron is adopted. These houses are considered practically indestructible, and possess the advantage of being perfectly impervious to atmospheric moisture. One of them, suitable for a family of four persons, can be erected within a fortnight and costs about $1000.

In the Philippine Islands and in some other localities where earthquakes are more or less frequent and severe, the people have commenced putting up iron edifices to resist the seismic influences.

The progress of building in this country, however, has passed the iron age, and that of steel is at present dominant. Gradually the use of steel for this purpose will become general, as the value of it increases in appreciation, and the steel house as well as the steel office building will be common along our streets.

The greatest triumphs of steel construction are seen in engineering projects—in bridges and towers—like those at Brooklyn and Niagara and across the Forth, and the Eiffel tower. These will serve as examples of first-class steel construction, and on their stability and endurance still greater works will probably be based.

Hardened Copper Bearings.

The tempering or hardening of copper is commonly looked upon as a myth, or a "lost art," which in nine cases out of ten means a "myth;" but it seems that copper can be hardened, and such treatment is now a regular commercial business. A company at North East, Pa., furnish hardened copper to order for any of the various uses where alloys have been previously employed.

Tests have been made of the hardened metal, at Pittsburg, showing tensile strength of 64,480 pounds opposed to 23,530 pounds for soft copper. The ductility of the metal after hardening remains even greater than before. Several railways have this hardened copper in use for locomotive bearings, and an electrical company at Philadelphia have been using it for dynamo and motor bearings, also for brushes, commutator strips and other purposes.

Copper is the base of nearly all the different alloys employed for machine bearings, and may be called the "active element" in such bearings. Its molecular or atomic structure varies from steel and iron more than in the case of any other available metal, consequently "interlocking" or abrading is less liable to occur. The term "anti-friction," so far as we know, applies to a difference in structure or "grain" of metals, accompanied with other qualities, such as hardness and the maintenance of form. It is true cast iron on cast iron makes a durable and anti-friction bearing, but this may be owing to the interstices for retaining lubricants and hardness, a supposition borne out by the fact that the risk of "seizing" or "cutting" is so great with such bearings that they are seldom used.

We strongly suspect that for bearings, when one member is made of soft iron or steel, hardened copper will be found the best material possible for the other part. It is true copper is an expensive metal, much more so now than it ought to be or is likely to be in future, but this will not matter much for lining metal if some plan is invented of applying a thinner shell. There is no doubt, in the case of any lining metal, that if it were thinner and soldered firmly to shells it would be much better than cast in and held only by mechanical fastening. In the case of solid bearings in cast iron, bushes of sheet copper, No. 14 for example, can be inserted and "expanded in" much cheaper than by the common method of casting, turning and fitting brass bushes.—*Journal of Industry.*

Steel Rules.

There are few branches of the engineering trades that require the exactness and precision requisite in the manufacture of steel rules, standards and measuring instruments. Accuracy and reliability are the two absolute essentials. In the general practice, the steel blades, after being prepared, by being ground, glazed and tempered, are coated by an acid-resisting varnish, especially made to suit the requirements of the trade, for upon this depends, in a great measure, the clearness of the divisions when etched. The varnish being dry, the blades are placed upon the table of a pantograph, which might well be termed a copying machine, as its work is to transfer to the steel blades, in a diminished size, any marks, letters or figures that may be traced from the copy. The latter is a plate of thin zinc, or any suitable metal, usually four times larger than the rules to be made—the divisions, figures and letters all being made four times larger than they are required to be when engraved upon the steel blades. The object of this increased size is to diminish any imperfection that may exist upon the copy.

There is a tracer connected by a system of steel bands and pulleys to the table, so constructed as to move in two opposite directions at right angles to each other. Above the table are fixed two rows of holders, each having a diamond point. These holders are raised and lowered at the will of the operator by a treadle, so that both divisions, figures and letters are traced from the copy and transferred, in a diminished proportion, to the steel blades. The diamond points being required only to cut through the varnish, the blades are taken from the machine and etched, the acid burning away the steel wherever the diamond point has been traced.—*London Machinery.*

FORCED DRAUGHT.—There have been many failures of boilers in the British navy, as well as in our own, under the operation of forced draught. This is accounted for by the Chief Inspector of Machinery as follows: The intense heat in the combustion chambers and tubes, generated by the "blowpipe" action of the forced draught, quickly evaporates the water in contact with the plates, and great quantities of steam are given off from them. The steam, in passing through the water, lifts it to some extent away from the plates, so that what is in contact with them is not water, but a mixture of water and steam, and while this is sufficient to prevent serious softening and bulging of the plates, it does not prevent so much overheating as to make the tubes and stays give way under the strain due to end-on expansion of the furnaces and tubes. The inspector advocates the use of larger boilers, that will supply full steam with a very low air pressure—equal to one-half inch of water.

ADVOCATES for the new system for converting malleable iron into cast steel claim that they have at their command the means of converting malleable scrap iron into the finest kind of cast steel in two hours. They claim that by a special flux and welding-process, tool and cutlery steel can be produced worth as high as $250 a ton at a cost of less than one-half cent a pound. This, they say, can be done with scrap iron worth $8 a ton, whereas pig iron, from which most steel is made, costs $18 a ton. The advantages claimed are "the saving of time in the conversion, the cheapness of the raw material and consequently of the finished product, the durability and hardness of the converted article and its resistance to corrosion."

MANGANESE PLATING OF IRON AS A PROTECTION FROM RUST.—According to our Italian contemporary, *Progresso*, articles of iron can be protected against rust by sinking them near the negative pole of an electric bath composed of 10 liters of water, 50 grammes of chloride of manganese and 200 grammes of nitrate of ammonia. Under the influence of the current the bath deposits on the articles a film of metallic manganese which prevents them from rusting.

MULTIPLICATION OF ELECTRIC INDUSTRIES.—Six years ago there were scarcely a hundred electric motors in operation in the United States for any purpose; to-day there are not less than 15,000 motors in use, applied to not less than 200 different industries, and an industrial revolution is taking place equaling, if not surpassing, in importance that attending the introduction of the steam engine, and marvelous in the rapidity of its growth.—*Sprague.*

ALUMINUM.—It is not generally known that one cubic inch of pure aluminum weighs one-tenth of a pound avoirdupois, or about one-fourth the weight of an equal bulk of pure silver. It can be rolled, spun, stamped, engraved, burnished, polished and soldered to about the same extent and process as used on brass.

SCIENTIFIC PROGRESS.

Wonderful Revelations.

After an exposure of 33 minutes a good telescope will record on the camera within its field a number of stars, which, if the field could be extended over the whole heavens, would give us a grand aggregate of 134,000,000 of stars. If the same instrument is allowed an exposure of one hour, the record will reveal the existence of the enormous aggregate of not less than 400,000,000. And this may be considered as embracing merely the nearest borders of space, which is in fact infinite in extent. Never before in the history of science has humanity been able to penetrate so far into the profundity of space or to find such a visible record of the infinity of worlds. The most perfect eye, aided by the most perfect instrument, without the camera, is able to detect the existence of not more than about 40,000,000 stars. This much has been accomplished by the scientific application of instruments to date. What will be the outcome of the future in this direction who can tell?

That there are stars not visible through any telescope, and which no telescope in the future will ever be able to reveal, which can yet be weighed, measured and their velocity calculated, seems almost incredible, yet the new developments of science make this possible. Dr. Klein contributes to the *Popular Science Monthly* for August a paper on the discovery of these invisible worlds, whose wonders surpass any marvels of romance or fable. The wishing hat of Fortunatus was not more marvelous than late revelations of the new science. Its peculiar property is that "it recognizes mutual relations between objects apparently lying far from one another, connects with one another phenomena which appear to have no common measure, and draws lines of connection between earth and sky." The spectrum analysis is the means by which this is done, and on this is founded the chemistry of the stars. It is shown that if a body is receding in space, the dark lines in the spectrum incline toward the red; if it is advancing and approaching the earth with rapidity, the lines incline toward the violet rays. This spectro-graphic method is that by which the most important discoveries in astronomy are now made. It is only recently that instruments sufficiently delicate to register these phenomena accurately have been perfected.

In regard to distances between the stars, the following will furnish abundant food for thought in connection with the above: "The star which gives the greatest parallax of any, and which in consequence is believed to be nearest to the earth, is Alpha Centauri, a star never visible in this latitude. But even this star's parallax is only 93-100ths of a second, which corresponds to a distance of 221,000 times the sun's distance from our earth, or over 20,000,000,000,000 of miles." It is but fair to assume that this is approximately not far from an average of inter-stellar distances. When we take into consideration the fact that we can have placed before our photographic vision 400,000,000 of suns like our own, existing in space, with such immense distances between them, and that even our enlarged vision can take in but a mere speck of the universe, we are utterly and absolutely lost in the contemplation. Nothing but an infinite mind can appreciate such wonderful revelations.

SLIME DEPOSITS IN WATER.—In storing "potable" water, in either ponds or tanks, there is nearly always neglect of means to cleanse the sediment deposited. Where such sediment comes from, especially in tanks fed by springs, is not easy to determine; but that there is a deposit of from one to two inches of black slime each year, is obvious enough. This slime is filthy in the last degree, and the water is spoiled. The sun has some strange effect in such cases. Covered tanks or pools do not become stagnant, or rarely do, while open ones without circulation are certain to become coated with a vegetable growth on the sides that is marvelous. This is especially true of artesian water when it is warm. At Stockton, a few weeks suffices for a thick, green vegetable growth on the sides of the pools, which decays, falls to the bottom and produces the black slime before mentioned. In the case of pools or reservoirs with sloping bottoms there is an easy remedy by providing a catch-basin or pocket, with a "blow-off" outlet. There is always some risk in direct pipes to the bottom of a reservoir, but the arrangement is common, and a service-pipe and blow-off, or cleaning-pipe, can be carried in together, the inlet of the former being fixed above the catch-basin or sump. Another way would be to put a siphon-pipe into the sump so that it could be cleaned to some extent without emptying a reservoir.—*Industry.*

LUMINOUS WATER.—Ernest Fahrig, in the *Chemical Trade Journal*, narrates that, being in a dark room, having in his hand a sealed bottle partly full of a solution of ozone in water, he idly shook it up; whereupon a soft phosphorescent glow of light floated above the surface of the water and pervaded the space in the upper part of the bottle. The appearance was only momentary, but on shaking up the liquid again immediately afterward, the light reappeared, although in much diminished intensity. Further repetitions of the shaking failed to produce any results, but after an interval of ten days the liquid had apparently regenerated its luminous power, for the same effects could be produced with it, although weaker. The phenomenon was afterward observed in another way, and some specially remarkable results were obtained by pouring a small quantity of an ozone solution into a glass beaker containing ordinary water. At first the cone-like projection of the solution, where it falls into the water, becomes luminous, and then the light suffuses the whole mass as the liquids become thoroughly mixed, finally dying away. It is described as a soft phosphorescent glow, which quickly spreads over the mass of fluid or gas, as the case may be, and as quickly disappears.

NATURE OF HEAT.—The real nature of heat is unknown. Scientific opinion is divided between two views respecting it. These are the corpuscular or emission theory and the undulatory theory. According to the emission theory, heat is a subtle fluid, destitute of weight, existing in all bodies, is capable of flowing from one body to another, and, though attracted by particles of other bodies, its own particles mutually repel each other. According to the undulatory theory, heat is attributed to the vibratory movements of the molecules of a hot body communicated to those of other bodies by means of a highly elastic fluid called ether, in the same manner that sound is transmitted through air. This ether pervades all space and, by other kinds of motions, is supposed to produce light and electricity. By the former theory, bodies cool by losing a portion of this subtle fluid. By the latter, they simply lose a part of the vibratory motion. Herein the emission theory, for convenience of explanation, is assumed, though at present the undulatory theory is generally received.—*The American Engineer.*

A NEW WAY OF MEASURING CURRENTS.—In 1851, Wiedemann discovered that if a tube containing bisulphide of carbon is surrounded with a wire carrying a current, the rotation of the plane of polarization is exactly proportional to the strength of the current. Starting from this point, M. d'Arsonval has devised a very simple arrangement for measuring currents and testing the accuracy of ammeters. In the apparatus recently shown to the Societe de Physique, a coil of wire was wrapped around an ordinary saccharimeter tube containing pure water or bisulphide of carbon. The E. M. F. of a single Leclanche cell will cause a rotation of one degree. The apparatus can be made as sensitive as one pleases, since for a given current the sensibility depends simply upon the number of convolutions of the coil.—*Electrical Engineer.*

NOT SATISFACTORY.—It is said that the electrical machine used in counting the census returns is not giving as satisfactory results as was expected. It works rapidly and wonderfully, and is a great labor-saver for the 1700 clerks in the Census Bureau, but it is a curious matter of experiment that the same machine will never count the same pile of returns twice with the same result. Under a challenge from an official in the bureau, 13 tests were made, and the only result that seemed at all accurate was a single footing in one district that was the same as that reached by counting in the old way by the clerks. The 1700 census clerks might have to work harder and longer if they should themselves count the returns, but the final result would be more accurate.

SPEED OF FISHES.—The dolphin and bonito are thought to be the fastest fishes, and although their speed is not known, those who claim to have made close observations say they are fully capable of 20 miles an hour. The writer has seen a school of four or five dolphins sport back and forth in the foaming water in front of a ship's prow, which must have been moving through the water at least 12 miles an hour, almost as if the ship was still. Of course the dolphins must have made a turn at every boat, and the boats were not less than 20 or 30 feet in length. A fish that could do that must have had the power of moving much more rapidly than 20 miles an hour in a direct line.

A NEW PHOSPHORUS COMPOUND.—Prof. T. E. Thorpe, the well-known chemist, has discovered a new compound of phosphorus (P_4O_6), which takes the form of acicular crystals, melts with the warmth of the hand, and glows under the same conditions as phosphorus. It burns readily in oxygen and chlorine, and forms a new compound with ethyl alcohol.

THE DEPTH OF THE MEDITERRANEAN.—It has hitherto been supposed that the maximum depth of the Mediterranean was 10,785 feet between Sicily and Sardinia. Lieutenant Magnaghi of Italy has found a depth of 13 550 feet between Malta and Candia.—*Revue Geographique.*

JAPAN'S LITERARY WELFARE is looked after by 475 newspapers, magazines, etc. Tokio alone boasts of 16 daily newspapers. It is imperative that each officer of the government should subscribe to the government organ *Kwampo.*

THE HUMAN EYE.—It is a well-known fact in science that the eyes are more the epitome of the man than all the other features that may help to suggest character.

ELECTRICITY.

The Ries Electric Traction Increaser.

The claims set up for this invention are attracting much attention in engineering and railroad circles. Quite a number of experiments have been made, and several exhaustive papers have been read before different societies. If the claims in its favor can be made practical, the invention will prove one of the most valuable in relation to railroad economy which has been made since the modern locomotive has been introduced. The most important series of experiments reported are those quite recently made under the immediate direction of the inventor, Mr. Elias E. Ries. It is claimed that this experiment showed that the invention, when properly applied to the ordinary tractive-power of locomotives, increased that power fully 25 per cent. In alluding to this series of experiments, *Electric Power* says that if the above claim can be realized, the following advantages will arise: Engines thus equipped will be enabled to draw longer and heavier trains, to mount steeper grades and to make better time; that the wear and tear upon the wheels and rails due to slipping and the use of sand is avoided; that light locomotives having sufficient steaming power can do the work of heavier engines, thus avoiding the increased strain upon rails, roadbed, bridges, etc., and in many instances rendering the reconstruction of the latter for heavier traffic unnecessary; that the condition of the weather cannot affect the schedule time by reason of lessened tractive adhesion, as at present; that trains may be brought under headway and stopped more quickly by reason of the absence of slipping of the drivers due to the action of the current; that the consumption of fuel for generating the traction current is considerably less than the saving in fuel effected by the absence of slipping alone; that in many cases the running of passenger and freight trains in separate sections may be avoided, as well as the expense and delays to traffic occasioned thereby; that a passenger or freight train drawn by a locomotive equipped with this system is safer and under more perfect control on steep grades, and finally that the earning capacity of a line of road having its engines so equipped can be very largely increased.

If the results of the experiments, as reported, are correct, there can be no doubt of the many advantages, as above set forth. But before the results claimed can be accepted and practically acted upon, these experiments must be further continued and more clearly wrought out. *Engineering News*, in commenting upon the subject, says: "Two facts may be considered as settled: (1) Under certain conditions electric currents of the proper volume and tension do increase by a large percentage the frictional adhesion of wheels to rails; and (2) if this can be effected with locomotives by plant of a simple and practicable kind, it will result in an important increase of their economic efficiency.

"The first of these we believe to be established beyond question by the experiments of Ries, Daft, Lyons, Levy and Schmidt, to mention no others. In a case of this kind, as in most others, negative evidence is of minor importance. The testimony of one credible witness that he heard a bell ring justly outweighs the testimony of a dozen that they did not hear it; and the testimony of two or three credible witnesses that they have produced certain effects with electricity, or with any other agent, justly outweighs the testimony of many others that they have tried to produce the same effect and failed. Their conditions may not have been the same. The conditions for increase of tractive friction are said to be the use of a low-tension 'quantity' current flowing in a closed circuit of low resistance moving with the motor; and we think the evidence is good that in this way effects can be produced which cannot be accounted for by natural friction or magnetic attraction, or both, and which seem to imply some molecular effect of the current on the metal."

In another article the same authority says: "Does the passage of an electric current from a wheel to the rail upon which it rests or rolls increase the possible traction with that wheel under a given load in practical service? This is a question which has been confidently answered in the affirmative by reputable engineers, and as confidently disputed by men of equal reputation.

"The results of careful experiments are said to have absolutely proved the theory, while other careful experiments are said to have wholly disproved it. On the whole, the burden of evidence is in favor of there being some possibility here which may prove to be of practical importance, and which imperatively demands further practical investigation.

"Perhaps the strongest evidence that the electric current does increase the coefficient of friction was given in a paper read a year ago by Mr. Leo Daft before the American Institute of Electrical Engineers."

After quoting somewhat largely from that paper, the *Engineering News* closes the subject by saying: "This much we may say, that there is probably no improvement which could be applied to the locomotive which promises such great results as an *effective* traction increaser. Mechanical devices to increase traction have been open to the objection that they increased to a dangerous degree the weight upon a single axle. One of the most important reasons for the economy with which American railways are operated is the large trainload hauled. If the electric traction increaser is successful in accomplishing what is hoped for it, the way will be open for a further large advance in this direction, with resulting gains in economy of service, which, from a financial view, are of many times the importance of any possible gain in any other direction."

GOOD HEALTH.

Effects of Poisons.

One of the most mysterious of physiological phenomena is the influence of minute quantities of certain substances when introduced into the circulatory system. The wonderful effect of vaccination is familiar to all, and even more remarkable are the terrible results produced by a mere trace of saliva from a hydrophobic animal—a poison which, apparently, remains dormant in the body for days, weeks, or months, and then suddenly springs into fatal activity. Similar effects follow from inoculation with the venom of serpents, but in such cases the poisonous effects occur almost immediately.

Even more powerful are the poisons used by the natives of Africa to render fatal the wounds made by their arrows, as described by Mr. Stanley in his recent work on Africa. These, when fresh, are of most extraordinary power. Faintness, palpitation of the heart, nausea, pallor, and beads of perspiration break out over the body with extraordinary promptness, and death ensues. One man died within one minute from a mere pinhole puncture in the right arm and right breast. A headman died within an hour and a quarter after being shot; a woman died during the time that she was carried a distance of a hundred paces; others, in varying spaces of time up to a hundred hours. The activity of the poison seemed to depend on its freshness. The treatment adopted was to administer an emetic, to suck the wound, syringe it, and inject a strong solution of carbonate of ammonia. This carbonate of ammonia injection seems to have proved a wonderful antidote if it could be administered promptly.

One of the poisons with which the weapons are smeared is a dark substance like pitch. According to the native women, it is prepared from a local species of arum. Its smell, when fresh, recalls the old blister plaster. It is strong enough to kill elephants. This poison is not permitted to be prepared in the village. It is manufactured and smeared on the arrows in the bush. All these phenomena are certainly wonderful and unexplainable; but for that matter, there is hardly any action taking place in the living body of which we can form any satisfactory conception of the true nature.—*Popular Science News.*

A MUCH-NEEDED ENTERPRISE.—San Francisco is to be blessed with a medical and surgical dispensary, one of the largest in the world, to be known as the Cosmopolitan Dispensary. The gentlemen in charge of the enterprise, who are men of means and great experience in medical matters, have leased and thoroughly remodeled the building at the junction of Market, Stockton and Ellis streets. There will always be in attendance a staff of eight physicians, six of whom will be in charge of the four consultation-rooms, which will be open to the public from 8 o'clock in the morning till 10 o'clock at night. Upon one physician, assisted by a pharmaceutical graduate, will be imposed the task of managing the medicine and express rooms, where all medicines intended to be sent to out-of-town patients will be prepared. The physician-in-chief will have charge of all correspondence, and will be assisted by 16 stenographers. All prescriptions will be carefully compounded by a skilled graduate, and all drugs will be bought at wholesale and retailed to patients at first cost. All correspondence will be kept perfectly secret and either burned or returned to patient. No charge will be made patients for examination, and if there is no cure the patient will be informed of the fact. The gentlemen in charge will only take cases they can cure, and whenever they fail to effect a cure they will make no charge.

THE PHONOGRAPH AS A DISSEMINATOR OF DISEASE.—It is reported that the Philadelphia park commissioners have ordered the disuse of the public phonographs heretofore in use in Fairmount Park, on account of the danger of their serving to disseminate disease. This danger is doubtless very slight, like that of injury to the ear, and probably neither danger is worth consideration if the instrument is kept reasonably clean and used properly, but its promiscuous use in a public park does not seem to admit of perfect security in this respect, and the announcement that the phonograph company intends to substitute a plate ear-piece for the penetrating one now in use, avowedly for the reason that there are persons who object to the present form, goes to show that the Philadelphia commissioners are not the only people who entertain the idea of danger in the phonograph. —*N. Y. Med. Jour.*

FAITH AND MIND CURE.—Charles Dudley Warner is quoted as saying that the difference between "faith cure" and "mind cure" is that the "mind cure" doesn't require faith and the "faith cure" doesn't require any mind.

SHOP NOTES.

Chisels.

In mortising without a machine, grind your chisel to a long basil or bevel. It will drive easier with a mallet.

Keep the flat side of the chisel facing the marks.

Grind the chisel on one side only.

A paring chisel is the very finest chisel made. It is long, thin and made of fine steel. A paring chisel should have an octagon handle, long and true, and should be put on in perfect line with the blade of the chisel.

Paring chisels, as the name indicates, are used for "paring or cutting any superfluous stuff on fine work."

A mortise chisel is a thick, heavy tool, made of iron, faced with steel. Generally there is a socket to receive the handle. Sometimes the top end of the handle is inclosed in an iron ring, placed there to resist the force of the mallet used in "driving" a mortise.

A firmer chisel is one midway between a mortise and a paring chisel. It is the most useful for amateurs, as it can be used for mortising and paring. They are pretty strong, and generally have turned handles with brass ferrules. For general work they should not be ground too thin, for if they are finely tempered they will break when used for mortising, and if used for paring they will answer very well if ground medium in thickness.

If we were asked how many chisels an amateur should want, who did not have "money enough" to get complete sets of the three kinds, we should say: For paring chisels, get one 2-inch, one 1½-inch and one ½-inch; for firmer chisels, get one 1¼, one 1½ and one ¾; for mortise chisels, get one ¼-inch, one ⅜ and one ½-inch. These will give the amateur a fair supply and give him all he wants for general amateur work.

Gouges are not so much in request by amateurs; sometimes, however, work cannot be done without them. It is generally the best policy for an amateur to buy gouges only as he wants them. The style of gouges is unaccountable; every curve requires a different set of gouges. When you want a gouge, get the curve, take it to a dealer, and get a tool to suit.—*Manufacturer and Builder.*

A KINK IN HAND SAWS.—A correspondent of the *American Machinist* says: Hand-saws are usually hung up by the handle, involving a very awkward operation every time they are taken for use or replaced on the pin. It usually requires both hands to go through this performance, so common to every woodworker that its awkwardness is not appreciated, and will not be until he has his saws intelligently hung up by the point, with the handle within reach. Then he will wonder why he didn't have that hole drilled in the point long ago. By the way, drilling that hole is the only difficulty in the matter, but any machinist knows how to drill a saw of ordinary temper. Don't be contented with a small hole, but make it $\frac{5}{8}$" or $\frac{3}{4}$", although the machinist will doubtless drill a small hole first. When you have your saws thus properly suspended, you will hang them up a dozen times a day where you now lay them down for a few minutes until you want them again. Besides, this method has decided advantages to the saw itself. Its handle is not scratched and marred by being constantly placed and replaced on a rough nail or screw, and its blade is not corroded by the sweaty hands of the workman, as is necessarily the case in the old way. It would be a decided boon to wood workmen if sawmakers could be induced to put this hole in the saws when they are made, and the writer hopes that the publication of this may tend to that result.

THE SQUARE HOLE AUGER.—They have in London a "Square Drill Syndicate" organized, as we are informed, to make and sell drills to make "square holes" in metal. What is to be done with the "holes" we are not informed, but will suggest that some of them be put on the market before too much investment is made in the drills. We have our modern methods of construction adapted to round holes, which seem to answer very well, and the few that require to be square are made at less cost than the maintenance of complicated "square drills" would amount to. In wood the case is different; wood is a laminated material with little strength except across its fiber, hence holes and mortises should be oblong whenever possible and can be so made by simple implements. The metal Cotter machines for making oblong holes have never come into general use, and a square drill has a still less promise of success.—*Industry.*

SPARKS FROM BELTS.—An interesting note from a correspondent of the *Electrical World* says: Some time since there was trouble with one of the arc machines in use, and after a careful investigation by Mr. Pierce, the electrician who kindly furnishes the facts, it was found that the static discharge from a belt to the frame, and thence to the armature, perforated the insulation so that the machine current had followed it and burned out the armature coil. The trouble once found, a very simple and effective remedy was employed. Grounded rods were bent from the pulleys so as to take the static discharge from the bolt. It is well known that quite a powerful spark can be obtained from belts under certain circumstances, but this is a remarkable instance of its effect.

USEFUL INFORMATION.

THE KEROSENE LAMP AND ITS DEFECTS.—The frequent accidents that occur in the explosions of kerosene lamps furnish strong evidence that there is something wrong in their construction. A gentleman who is engaged in the business of selling kerosene lamps and oil stoves writes to the *Scientific American* as follows: "The present system of burning oil, both in lamps and oil stoves, seems like a satire upon this progressive age. A flame oxygenated by air currents to the fiercest heat is placed directly in contact with a brass tube through which all the oil consumed has to pass. Of course this tube, being always made of brass, is one of the most rapid conductors of heat, and soon becomes excessively hot. A better device for generating explosive gas could hardly be conceived. The worst of it is that the gas thus rapidly generated falls into the oil font and is all ready for an explosion the moment that the smallest part of it comes in contact with fire. A slight current of air will often convey some of this gas to the flame, when the conflagration or explosion is almost sure to follow. If some of our inventors would substitute some device for the present mechanical and scientific outrage, something not too complicated and expensive, I risk nothing in asserting that such a device, if brought before the public in a business way, would become universal. The horrors referred to have now become so frequent that they receive only a brief and passing notice in the daily papers."

HOW TO WATER PLANTS IN POTS.—Success or failure in the growing of house plants is largely due to the care and attention paid to watering. Like everything else, what is worth doing is worth doing well. When plants require water, give it unsparingly. The system to adopt is to be thorough rather than regular. Many persons water their plants as regularly as they wash their faces, which will not do. A plant should not be watered unless it needs it, and it does not need it so long as the soil contains sufficient moisture for the plant's use; more than that is an injury. Water should never be given until the plants show by the drooping of the leaves that they need it. Then give with a liberal hand, not simply a surface wetting, but give until every particle of soil in the pot is wet; let it go to the bottom. Many plants have been so long potted that the ball of roots and earth is almost impervious to water. Water applied to such, ten times a day, will do but little good; the pots should be put in a tub of water occasionally, and left there for 24 hours, the pot all under water, then they will get a wetting that is useful and lasting.—*Agriculturist.*

PROTECTION OF MINE TIMBERS FROM DECAY. The German government mine Altenwald, near Saarbrucken, has, since 1888, conducted a series of experiments to ascertain the most effective means to prevent from decaying the pine timbering, which is subject to great pressure in the airways. Lime, coal tar, tar and carbolineum were tried in such a manner as to enable a comparison of their relative protective value. The results as published in *Ztsch. f. d. Berg, Hutten u. Salinenwesen* show lime to be the weakest. Coal tar preserved the outside of the timber, while the core was found completely decayed. Carbolineum proved by far the best, and is now being used on all the timbering of the upcast in that mine. The mine timbers, made of wood peeled and dried, are twice painted over with the carbolineum above ground and require each, when 2.5 meters long and 0.25 meter in diameter, in the first application 4.5 kilogramme and in the second 3.5 kilogramme, so that, at a price of 34.5 pf. per one kilogramme, the total cost was: For material 48.3 pf. and for labor 14 pf., or altogether about $0.15.

HOW TO DESTROY GERMS IN WATER.—Dr. C. G. Currier says, in the *Medical Record*, that water is easily sterilized by keeping it at or near the boiling point for 15 minutes. Five minutes' heat is sufficient to destroy all harmful micro-organisms. Still less time suffices to destroy the disease-producing varieties which are recognized as liable to occur in water. Thus merely raising to the boiling point a clear water containing the micro-organisms of malarial disorders, typhoid, cholera, diphtheria, or of suppurative processes, and allowing it to gradually cool, insures the destruction of these germs. They are also destroyed by keeping the water for from a quarter to half an hour at a temperature of 170° C. Occasionally, however, very resistant but harmless bacteria may get into water. The brief heating renders them safe for eating purposes; but when it is desired to destroy every micro-organism that may be present in a contaminated water, it should be heated for one hour and allowed to cool slowly. It may then be used for cleansing wounds, or for alkaloidal solutions, which will keep indefinitely if no germs be introduced after the solution has been heated.

PAINT SPOTS may be removed from wood by covering them with a thick coating of lime and soda. Wash off after 24 hours.

MINING AND SCIENTIFIC PRESS.

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Business Announcements.

[NEW THIS ISSUE.]

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Passing Events.

The two legal holidays have broken into the business week, and the city has been filled as it never was before with visitors from the interior. The 40th anniversary of the admission of California into the Union was splendidly celebrated by the Native Sons of the Golden West and the Pioneers, one of the main features being the largest procession ever seen on the Pacific Coast. The immense crowds were well behaved, and there were no accidents to mar the pleasure of the celebration.

Considerable interest is manifested in the probable result of the suit of the Mining Stock Association against the Hale and Norcross Mining Company directors for restitution of moneys alleged to have been wrongfully diverted from the company. If these directors are proved to have acted unlawfully, the directors of other Comstock companies will doubtless be called to account in a similar manner.

The molders' strike in the foundries continues as for some months past. The union men are still out, though the shops are running with non-union men from the East.

COAL AND GOLD IN ALASKA.—The Alaska Commercial Co. is developing both gold and coal on Unga island, and about 100 men are at work. Next season a still larger force will be employed.

Failure of the Silver Bill.

If there is anything lacking to convince the most skeptical that the Silver bill is a wolf in sheep's clothing, it is found in the speculative movements of the metal. From 92 cents the price was advanced (under the belief that a silver bill would be passed by Congress) to about a dollar an ounce. After the law went into effect, under steady buying by the Treasury Department at Washington, the price at one time reached $1.20¾ an ounce, but it fell with smaller purchases to below $1.17 an ounce.

These movements are unmistakable evidences that the bill does not meet expectations and was another bold attempt to demoralize silver, for, while pretending to make it the basis for the circulation of silver certificates, in reality the law places the entire control of the currency, as before, in the hands of one man, the Secretary of the Treasury.

There is no denying the fact that a large majority of the citizens of the United States want a stable currency, one based on bimetallism, and that a more determined move will be made to its acquirement by remonetizing silver. What they demand, as expressed through their various organizations, and what they intend to have, is the full, free and unlimited coinage of silver into money bearing the stamp of the Government and placed in actual circulation. They, so far as we can ascertain by our exchanges, have no objection to silver certificates to be used in handling as a substitute for the silver, but they want the silver first coined and placed beyond the reach of Wall street and the National banks.

No fears need be entertained that by free coinage this country will be made the dumping-ground for other countries, for events of the past month prove the contrary. Writing to the Manchester *Guardian* on the silver question, a leading European authority, Sir Morton Frewin, has the following to say on this particular point:

The silver market will be very bare of supplies after Christmas, so that before the next session of Congress is half through the United States par of exchange (1 to 16) will have been restored and the rupee will be at 22 pence. There will then be a proposal, supported by both political parties, that the United States shall join the monetary league of the Latin Union with mints open at 1 to 15½. We shall then have entered upon this currency phase. Any 15½ ounces of silver coined at Washington will enable the holder to draw an ounce of gold from the Bank of England, the bank being powerless to protect its reserves. The operation will be conducted on these lines. I take silver to the United States mint, which is coined freely, and returned to me, if I prefer, in the shape of notes. These notes I deposit in my bank in New York, and I proceed to invest my bank balance in the purchase of New York Central Railway bonds. These bonds I sell by cable in London for gold; so that just as long as any European investor will buy American securities every 15½ ounces of silver will be available to draw an ounce of gold from the Bank of England, the bank having no discretionary power to refuse to pay gold.

The Mechanics' Fair.

Now that the Native Sons have got through with the Pavilion, the Mechanics' Institute again has possession, and during the latter part of this week has been putting it in order for the coming fair. The big building will be all ready on Monday to receive articles intended for the exhibition. As the time is short, all intending exhibitors should be promptly on hand to arrange their displays. It is to be hoped there will be no delay on their part, so that the superintendent and those who assist him will not be so rushed on the day or two preceding the opening of the fair.

Although the use of the Pavilion by the Native Sons in celebrating the 40th Anniversary of the Admission of California into the Union has delayed matters connected with the fair to some extent, there is time enough to arrange all the displays, provided the exhibitors set right at work. Supt. Culver has everything prepared for them as far as lies in his power. It is the intention this year to have the fair exceed in interest any that has preceded it. A number of special features are promised, and as for once it does not come at the same time as the State Fair, a very large attendance is expected. As the industries of this State are being rapidly extended from year to year, there should be a larger representation than we have ever had. The Mechanics' Fair is not a local one merely, but aims to represent the interests of the State at large as well as the city.

Comstock Mine Management.

On last Saturday, M. W. Fox, Chairman of the Executive Committee of the Mining Stock Association, through his attorney, W. T. Baggett, filed a suit in the Superior Court for the recovery of $2,250,000, which he alleges has been misappropriated and which he claims rightfully belongs to the stockholders of the Hale & Norcross mine. The suit is entitled M. W. Fox, plaintiff, vs. the Hale & Norcross Silver Mining Company (a corporation), C. F. Bridge, M. Hoeflich, H. M. Levy, W. E. Sell, Jos. W. Souther, W. C. Watson, Chas. P. Egan, A. K. P. Harmon, Jos. Marks, Chas. S. Wheeler, E B. Holmes, J. B. Low, Richard Roe, John Doe, James Black, John White, Daniel Bline, defendants.

The bringing of this suit will undoubtedly throw much light, through official investigation, into the subject of mining and milling Comstock ore.

Based upon statements heretofore published by the MINING AND SCIENTIFIC PRESS, the Mining Stock Association has been assiduously at work in gathering facts and figures upon which to ground their suit, and, so far as we can learn, with better results than the leading men of the organization had dared to expect. But there is yet considerable to do in the compilation of the information already gained, besides the securing of much more which they are in reasonable hopes of getting. Within the past week they have received from the Carson Mint official data by which it is claimed they can trace all the bullion alleged to have been taken to the Mint at unseasonable hours and sold, the proceeds from which they claim have been misappropriated. This, it is needless to say, is an important link in the evidence required to substantiate the charge that the Hale and Norcross mine has not been managed in the interest of stockholders.

The making of each and all of the directors of the company defendants in the suit brought by Mr. Fox, is done looking to the securing of the rights of stockholders in the event of the court deciding in favor of the plaintiff.

Some of the directors are reputed to be wealthy, and in accepting the office of trust they made themselves responsible for the management of the company's affairs in the interest of each and every stockholder. Assuming this position, they are pecuniarily liable for all funds, bullion, etc., misappropriated, not to call it by a harder name, and they can by law be compelled to make good the amounts wrongfully taken, and if collusion can be proven they are liable to criminal prosecution.

If the Carson mint records show what it is claimed they do, then the United States Government must, in duty bound, take cognizance of the fact and institute a thorough investigation, besides bringing suits in the courts against the mint officers said to be guilty of collusion with those who have sold bullion taken to the mint between two days, the proceeds from which were diverted from the stockholders, to whom it rightfully belongs.

In this connection, it may not be out of place to state that the publicity given to the way Comstock ores are milled, is bringing in inquiries from leading lawyers at the East, asking for fuller information and all the data obtainable on the subject. This they are doing in the interest of Eastern stockholders, many of whom are reputed to hold large lines of Comstock mining shares. It is shrewdly surmised that these inquiries are instituted with the view of bringing suit in the United States Circuit Courts at the East against the officers or managers of one or more of the Comstock mines.

THE Secretary of the Treasury, after a consultation with the Director of the Mint, decided that he will purchase under the new law 7,280,000 ounces of silver between August 13th and September 30th, so as to start on October 1st with a purchase of 4,500,000 ounces per month. Purchases to date make a total of 4,500,859 ounces since the law went into effect.

Northern Pacific Mineral Land.

U. S. Senator Morgan has introduced a resolution directing the Senate committees on the Land Grant Forfeiture bill to insist that all mineral lands granted to the Northern Pacific, except coal and iron lands, be disposed of under the mining laws, the same as if they were a part of the public domain. Whenever the Northern Pacific shall relinquish its title to any of these mineral lands, it shall receive in lieu thereof an equal amount of agricultural or timber lands. The conferees are instructed further to insist upon a provision declaring that the United States retains the right to amend the Act or to hereafter declare further forfeiture of Northern Pacific lands. He also introduced a resolution calling upon the Secretary of the Interior for full information respecting the number of suits between the settlers and the Northern Pacific, the proceedings taken in them, whether the railroad company has changed the location of any part of its roads, whether lands were reserved along the line of this new section of road, and whether any part of the road was definitely located within the time fixed in the charter.

This is an excellent step. The miners of Montana particularly were in danger of losing valuable mineral lands by the claims of the railroad company. The subject has been agitated for the past year or two, and the miners banded together to bring the matter to the attention of Congress. It seems they have succeeded, and now that official attention has been called to the subject, it is not probable that the railroad company will get this mineral land. Congress never intended it should in the first place, but the company has claimed everything in sight. Could they verify these claims, an immense extent of public mineral land would come into their possession, and the prospector's range become proportionately narrowed.

The Admission-Day Celebration.

The Native Sons of the Golden West who took charge of the celebration of the 40th anniversary of the admission of California into the Union may congratulate themselves on having arranged and carried out the most successful affair of the kind which ever took place in this State. For nearly a week the city has been in holiday attire and has been thronged with visitors from all parts of the State. It is conceded that there never were, in one day, so many people in San Francisco as on the 9th, the day of the procession. The transportation companies, although prepared for a crowd, found their facilities taxed to the utmost. The regattas, procession, receptions, fireworks, ball, bay excursion and all festivities passed off with great success and no accident.

The procession was the main feature of the celebration, and was the largest ever seen on this coast. All sorts of things reminiscent of pioneer days in California were represented, the early mining features being specially prominent. The different Pioneer societies joined with the Native Sons in making the affair a success, and the citizens and visitors were in good-natured accord with the whole celebration.

SAN DIEGO SALT.—The San Diego *Union* says that the output of the La Punta Salt Works, below the city, on the bay front, is expected to amount to 10,000 tons this fall, instead of the usual average of 600 or 700 tons. Eugene E. Shaffer, who has conducted the works for the past eight years, was in the city yesterday. He said that they were just now in the midst of their producing season, and would harvest by about November 1st. Instead of depending upon the high tides to fill their 40 acres of ponds, which a dam protects, they have put in this summer a steam pump, which brings the salt water from the bay to the vats.

THE Virginia *Chronicle* says that the Comstock mines generally are looking well, with plenty of ore in sight and ample milling facilities, which could not by any means be said at this time last year.

EIGHTY carloads of chrome have been shipped this season from near Red Bluff to Philadelphia. The mine is 25 miles west of Red Bluff.

DANIEL STREETER of Biggs, Butte county, has gone to Eugene City, Oregon, to open a coal mine near the latter place.

Quicksilver.

In another column of the PRESS is given an abstract of a census bulletin on the quicksilver mines of the United States. In fact, all the quicksilver mines of the United States are in California, with the exception of one or two unimportant ones in Oregon. The 11 productive mines of the country are in this State. The six unproductive mines are those the stoppage of which was caused by litigation, by low prices of product or by lack of sufficient capital and experience to pursue a hazardous industry. It is considered probable that all of those establishments now closed and unproductive will resume work when higher prices for quicksilver can be obtained.

The producing mines of this State employ 937 operatives, and last year produced 95,714 tons of quicksilver ore of an average of 1.088 per cent, producing 26,464 flasks of mercury worth $1,190,500.

The earliest records relating to production of quicksilver in California are for 1850, cinnabar having been first discovered there in 1845, and but very little quicksilver was produced prior to 1850, when active work was commenced at New Almaden. Outside of California, quicksilver has been produced in two localities in the United States—in Oregon to the extent of 2000 flasks, and in Utah, where about 200 flasks were reported. In the last ten years all the mines of the United States have produced 407,675 flasks; the Spanish, Austrian and Italian mines in the same period have produced 685,930 flasks, of which 483,939 flasks were from the Spanish Almaden mine. The grand total production of the quicksilver mines for the past ten years was 1,093,611 flasks. In the last 10 years California's quicksilver product aggregates in value the sum of $13,258,000. This State's product from 1850 until this year was valued at $69,258,000.

LAND TROUBLES. — Placerville *Republican*, Sept. 4: The United States Circuit Court some time ago rendered a decision affecting the title to all lands in the odd sections granted to the Central Pacific Railroad Co. which had been obtained under mining applications from the Government subsequent to the grant. The effect of the decision was to confirm to the railroad company all lands in the grant, whether mineral or agricultural, from the time the grant was made, and to vitiate the title of lands held under mineral patents. Following this decision, the railroad company has notified owners of such land, a number of whom reside in this county, that suit will be commenced against them to recover the land which the company claims under the grant from the Government.

Oregon Scenery.

The beauty of the Northwest is the theme upon which every visitor delights to descant. It is of a type wholly different from that of California, and it is conceded, we believe, to be far more grateful to the eye. The whole Pacific Coast is, however, so well endowed with Nature's best work that comparisons are needless—each has enough to stimulate and ennoble all who attune their hearts to Nature's sublime lessons.

The Northwest has many scenic features, but the scenery of the Columbia has commanded the greatest effort from poet and painter, and it is indeed grand and entrancing. Our photo-plate gives a glimpse of a beautiful scene in the palisades. Of the scenery of the Columbia an admiring local writer has penned these words:

The Columbia river passes through a country which, among other features, affords the grandest and most picturesque of scenery. Tourists who have traveled in many countries pronounce the ride up the Columbia from Portland the finest within the range of their experience, and even declare the scenery to be the most magnificent along any river on the globe. The Columbia receives its large tributaries, with the exception of the Willamette, before breaking through the Cascade mountains. The whole course of the Lower and Middle Columbia is through a mountainous country. The towering rocks, abysmal chasms, wooded cliffs, gloomy caverns, cascades and cataracts are made familiar to the voyager on the Columbia, who can spend any time he chooses at specially interesting points along the shores.

The palisades of the Hudson, the pictured rocks of Superior, the rugged crags of the Alps, the picturesqueness of the Rhine, the deep wilderness of the Amazon, combine on the banks of the Columbia to make a continuous scene of rare beauty and sublime grandeur. The steamers, which ply regularly on the river, carry thousands of delighted tourists annually through this American wonderland, any attempt to describe which only makes evident the poverty of language.

The Gold Belt of California.

Ancient River Channels and Gravel Deposits.

[Written for the MINING AND SCIENTIFIC PRESS by STEPHEN BARTON of Kernville, Cal.]

I have been very much charmed by the articles from the pens of H. G. Hanks and J. F. Talbott on the ancient placer deposits of California. Mr. Hanks appears as an honest inquirer searching for truth, fearless of the established dictum of scientific lore. Mr. Talbott appears as a plain and unpretending miner, who has the modest courage to give his observations to the world and the reasoning fairly deducible therefrom. Both writers have done much to awaken an interest in gravel mining.

The subject was well worthy all the investigation Mr. Hanks was able to give as to whether glacial deposits ever present the phenomena of a continuous flow of water-worn gravel, or whether much of it presents the appearance of fragmentary rocks set in sockets of ice while one side was being planed down. There are several objections to the theory of a glacial deposit suggested by my observation. The first of these objections is that the flower which adorned the banks of these ancient streams was the same as that met with in California to-day. The manzanita, the alder, the yellow pine and the black oak, flourished upon their banks, formed drifts upon the pay gravel and were afterward covered with cement, which in its turn was covered with a lava flow. I have followed the track of some of the most noted ancient glaciers ever known to have had an existence in California, and have found no moraine clearly glacial in character extending below an altitude of 7000 feet above the level of the sea.

A second objection to the glacial theory is that the gold is generally deposited on about the same slope of bedrock met with in the rivers or in an artificial ground-sluice which is run partly bare.

A third objection to this theory is that after the lava flow—after the bed of the stream had been raised 200 feet above the bedrock—and before the stream had cut a new channel in softer ground, some of the lateral tributaries continued to send down auriferous gravels and deposit them on top of the lava, showing that placer gold came from the country traversed by the lava flow, instead of being transported an interminable distance by a glacier.

But it seems to me that if the first objection can be sustained, then the glacial theory must fall. We must appeal, then, to the observations of the thousands of truthful and energetic men who set commerce in motion by tearing down the ancient hills. Beneath Cedar hill, just south of the village of Placerville, in El Dorado county, an immense amount of timber was found lodged on the gravel, and generally of the varieties I have mentioned. This hill was capped with what would be termed brecciated lava. This form of lava is most common in the central portion of the mines, and was evidently formed by a crust forming on the surface of the stream and then breaking into fragments and partially sinking in the half-congealed mass. At Gold Hill, just west of Columbia, Tuolumne county, where only the cement and gravel were left, trees of valley oak and yellow pine were unearthed, also at the Buchanan tunnel beneath Table mountain, a mile and a half northwest of Columbia. In a channel known as the Fox Head, rising in the flat one mile west of Columbia and descending to the southwest beneath Table mountain, alder and manzanita leaves were found. But it is useless to enlarge on this branch of the subject. The banks of the ancient rivers were clad with a verdure semi-tropical in its nature, and for millions of years after the rivers had sought their present beds the mastodon maximus found a favorite resort in the placer mines of Tuolumne.

During all these centuries this huge animal and the Indian evidently watered at the same spring, and up into the post-pliocene age the bones of the mammoth were buried beneath calcareous tufa on the same bedrock where the Indian woman had ground her acorns.

Scientists are too apt to hurry up nature by the employment of cataclysms. Time will plow out the channels, and mathematics will give the time, without betraying the age of the world.

Mr. Talbott mentions the fact that two of these ancient channels evidently descend from the same source. This would be pretty good evidence that the stream was nearing its delta, and as a corollary, that it met the ocean at a higher level than now. My observations have tended to the conviction that there have been two periods of volcanic activity in the region of the placer mines, and that during the first of these periods the rivers met the ocean at an altitude of 2000 feet above their present level. I think it susceptible of geological demonstration, that after volcanic action had ceased on the western slope of the Sierra Nevada mountains, Kern river met the ocean 1200 feet above the Tulare valley.

VIEW IN THE PALISADES ON THE COLUMBIA RIVER.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

BACON LAND AND IMPROVEMENT CO., Aug. 25 (Oakland). Capital stock, $300,000. Directors—H. D. Bacon, F. P. Bacon, F. S. Page, C. H. Berlin and F. A. Berlin.

DENBORN CO., Aug. 25. Object, publishing, mining and commercial business. Capital stock, $100,000. Directors — Richard Stevenson, Henry A. Cummings, George F. Richardson, James Horsburgh, Jr., William Sproule, J. Otto Heppner, William C. Brown.

PACIFIC WERNSTROM ELECTRIC R. R. CO., Aug. 25. Capital stock, $20,000. Directors—Dwight E. Ryland, C. T. Ryland Jr., H. T. Scott, John T. Scott, D. I. Mahoney.

MODESTO LUMBER CO., Aug. 26. Capital stock, $40,000. Directors—Austin D. Moore, John R. Hanify, Alonzo M. Green, John R. Jarboe and George W. Bates.

BRAZILIAN MAN'F G CO., Aug. 27. Capital stock, $500,000. Directors—J. C. Bates, M. C. Walton, P. A. Campbell, J. F. Davis and A. Walrath.

LOS ANGELES CONSTRUCTION CO., Sept. 2. Capital stock, $1,000,000. Directors—G. H. Bradshaw, A. D. Brock, G. F. Barnwell, R. A. Friedrich and F. E. Birge.

SAN FRANCISCO FRUIT & WINE CO., Sept. 2. Capital stock, $200,000. Directors—J. H. Wilson, D. Hay, W. H. Hay, W. M. English and I. M. Hay.

HALL MANUFACTURING CO., Sept. 3. Object, manufacturing "Hall's Antiseptic Salve." Capital stock, $100,000. Directors—W. R. Hall, L. E. Mitchell, A. E. Potter, A. O. Colton, E. W. Haines, J. N. E. Wilson and E. J. Mott.

KERN COUNTY LAND CO., Sept. 3. Capital stock, $1,000,000. Directors—Lloyd Tevis, J. B. Haggin, I. C. Stump, Will S. Tevis, W. F. Goad and Henry Wadsworth.

KERN COUNTY CANAL & WATER CO., Sept. 3. Capital stock, $5,000,000. Directors—Lloyd Tevis, J. B. Haggin, I. C. Stump, Will S. Tevis, W. F. Goad and Henry Wadsworth.

LOW COST OF MILLING.—The Amador *Ledger* says that Tripp's claim on the Mokelumne mines, hauls and mills its ore for 61 cents per ton. The El Dorado *Republican* says the Dalmatia mine near Kelsey, in that county, is mining and milling by electricity at a cost of 42 cents per ton. These examples beat the Spanish mine in Washington township, Nevada county.

THE Risdon Iron & Locomotive Works of this city have on hand 12 Frue concentrators, which, though in first-class order, will be sold for a low price.

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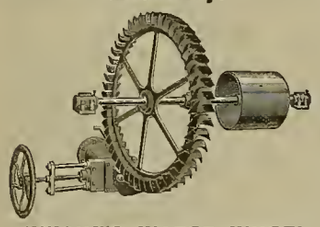

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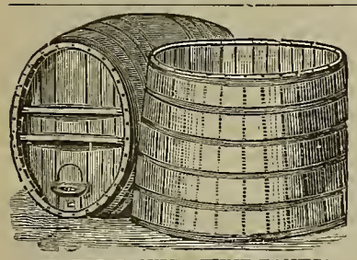

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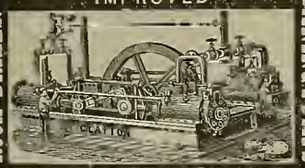

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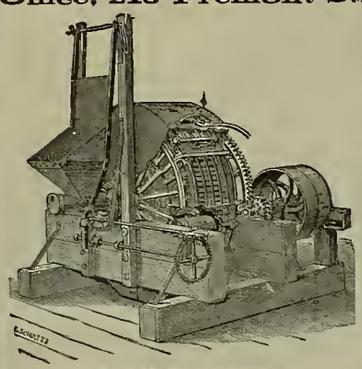

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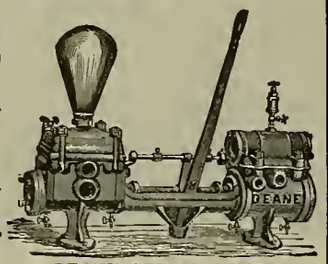

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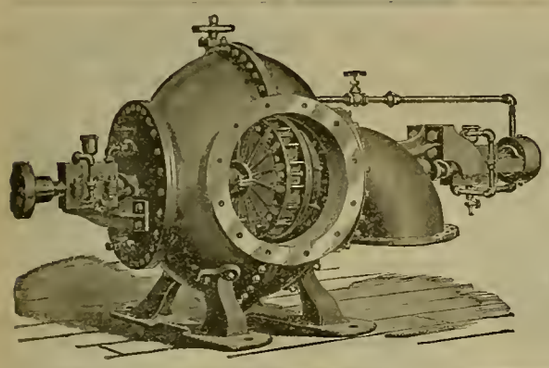

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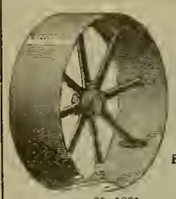

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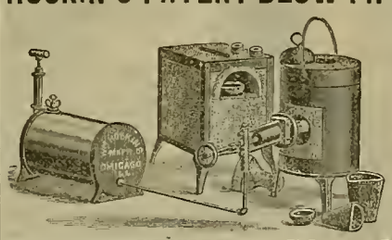

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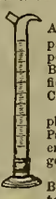

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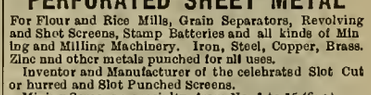

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Mining Share Market.

On Thursday, Friday and Saturday the mining share market was lifeless at blackboard quotations. Monday and Tuesday being legal holidays, the two exchanges were closed. On Wednesday, the market opened with considerable life and strength, particularly in Potosi and Challenge, both scoring a 15 per cent advance. In outside shares there was no trading in the Tuscaroras and very little in the Bodies and Quijotoas.

The situation warrants much better prices for the Comstocks, provided confidence was felt that the mines were being honestly worked; but even as it is, higher prices are likely to obtain. This opinion is grounded upon the well-established fact that insiders have been steady buyers of stocks for some time past, and consequently they have considerable cheap bought stocks which will net a good profit at a higher range of value, and better prices can be obtained in two ways—one by cross-orders on the up grade and the other by a few cross-orders on either a showing or talk of ore development. This was lately done in Potosi and Bullion. Insiders can show up rich ore at any time desired, but whether it is policy or not is questionable, except to sell stocks at good prices, for under the present method of milling, the bullion can be spirited away and no questions asked.

News from the Comstock mines is of an important charac er. Active prospecting work is under way from Caledonia in the south to Scorpion in the north. There is every encouragement of important developments soon. Failing in this, insiders should show up that ore body going over $60 a ton that was discovered several months ago in one of the Gold Hill mines, and which at the time we published officially. They should also show up the rich ore lying to the west in Hale & Norcross. It now looks as if the insiders are going to show up that ore on the 1750-foot level in Con. Virginia, at least more active work has been inaugurated on that level. Miners are watching with renewed interest the work going on in Ophir, Union, Sierra Nevada, Chollar and the Gold Hill mines. A well-informed person says that ore from Seg. Belcher is being hoisted through the Overman shaft. It is stated that the pumps will be started next month. It will not take long after starting up to drain the Gold Hill and Alta group of mines. The superintendent of Kentuck is very confident of finding an ore body in that mine, lying over 100 feet west of west ledge. The ground improves as work progresses.

From the outside mines the news from the Tuscaroras and Quijotoas is very favorable. From the Bodies our advices report all work in Mono suspended. In Bodie they are sinking a winze below the 700-foot level. The news from the mine is growing more important and deserves close watching.

Sales at San Francisco Stock Exchange.

THURSDAY, Sept. 11, 9:30 A.M.

50	Alpha Con.	1.20	
300	Andes	1.20	
200	Belcher	3.25	
10	Belle Isle	1.05	
950	Bullion	2.75@2.80	
100	Caledonia	50c	
100	Challenge Con.	2.50	
360	Chollar	3.20@3.35	
175	Con. Cal. & Va.	4.85@4.85	
10	Confidence	6.00	
400	Con. Imperial	35@40c	
200	Con. New York	45	
200	Crown Point	2.85	
100	Exchequer	1.00	
30	Hale & Nor.	2.45	
200	Hendricks	35c	
100	Justice	1.40	
100	Kentuck	1.45	
300	Lady Wash	6@65c	
50	Mono	55c	
100	N. Commonwealth	2.25	
300	Occidental	1.35	
300	Ophir	5.00	
100	Overman	2.20	
575	Potosi	6.87½@7.00	
100	Savage	3.90	
100	Scorpion	20c	
100	Seg. Belcher	1.35	
300	Silver Hill	40c	
40	Union Con.	3.00	
200	Utah	1.05	
200	West Comstock	55c	

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Any stock upon which this assessment shall remain unpaid on the 29th day of September, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 20th day of October, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

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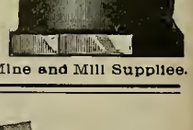
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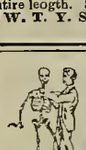
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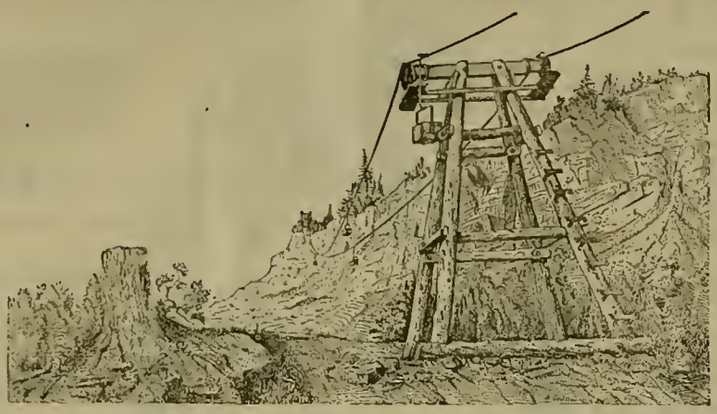

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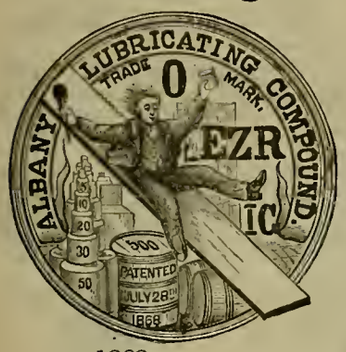

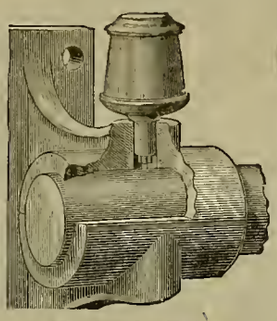

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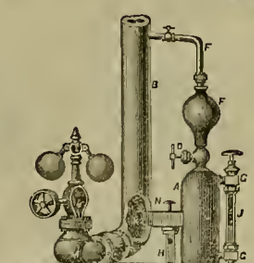

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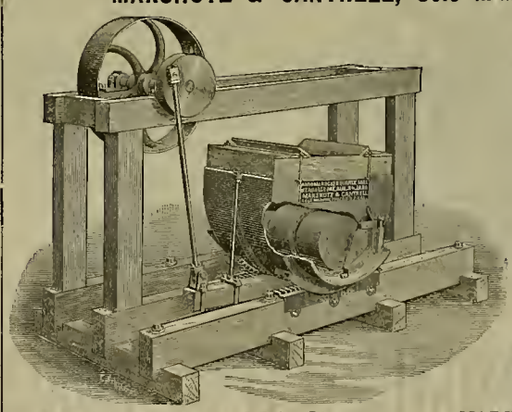

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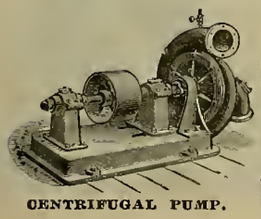

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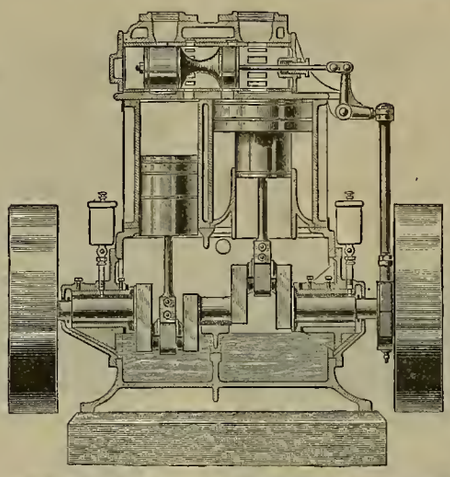

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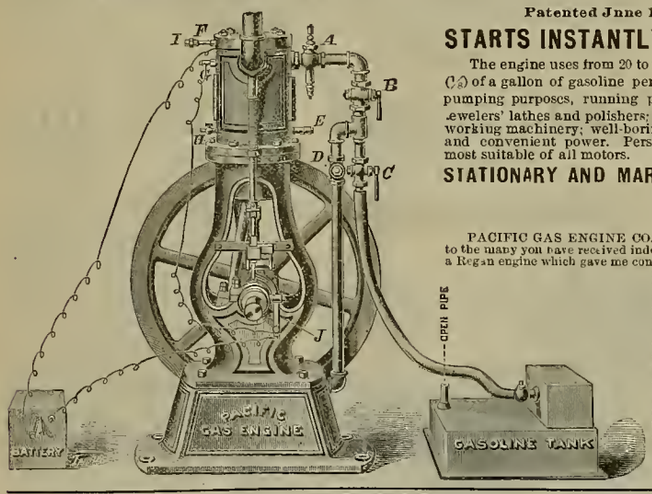

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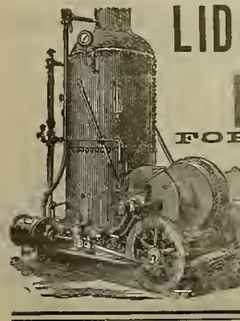

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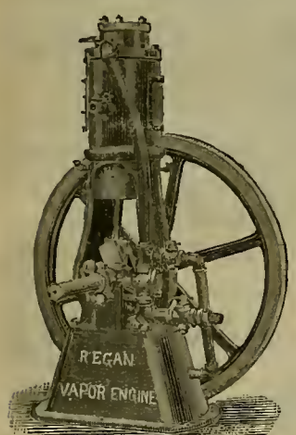

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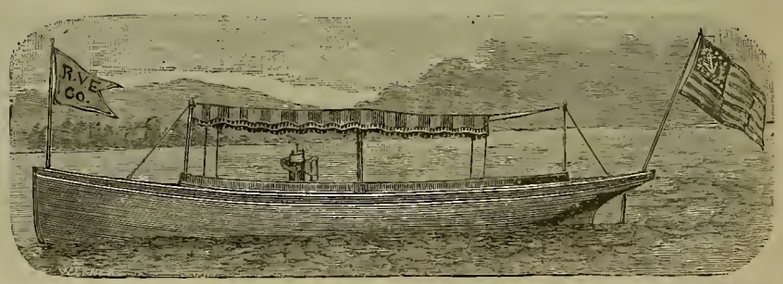
REGAN VAPOR ENGINE CO.—Gentlemen: The 2 H. P. Engine you put up in our factory last November, has given satisfaction beyond my expectations. It do s my work better than than those two Electric Motors did, with scarcely any expense for gas. I paid the Motor Company $25 per month for power, while the Vapor Engine has cost me but $2 per month so far. But, be it understood, I have not used the Engine as much as in summer, but the cost of motor would have been all the same, making a saving of $69 in three months. I am satisfied the Engine will pay for itself in less than two years. I use it for freezing cream, run three fans, cocoanut grater, etc.

Yours truly, GEO. HAAS.



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The uses for small steamboats and launches are innumerable; they are convenient and serviceable for transportation and are a source of pleasure for those who are fond of sailing. But many have been deterred from purchasing such boats, because of the trouble and inconvenience of using coal, and the necessity of obtaining a Government license, engineer, etc. Our motor does away with these objections. The small space taken up by our engine in the boat **gives more room**; the boat will seat **twice** as many persons as one the same size fitted up with a steam engine. It takes only **two minutes to get under headway**, and can be stopped when running at full speed within the length of the boat, the reverse motion being instantaneous and effective. We carry in stock six regular sizes of hulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos. Kane & Co, Racine, Wis.

REGAN VAPOR ENGINE CO., 221-223 First St., San Francisco, Cal.

Centrifugal Roller Quartz Mill.

F. A. HUNTINGTON.

— MANUFACTURER OF —

CENTRIFUGAL ROLLER QUARTZ MILLS,

Concentrators and Ore Crushers,

Mining Machinery of Every Description. **Steam Engines and Shingle Machines.**

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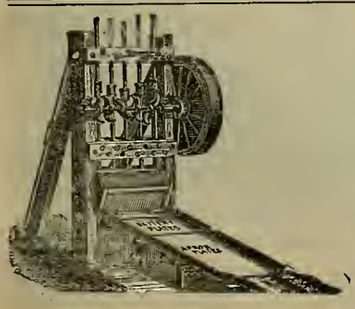

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SILVER-PLATED AMALGAM PLATES for SAVING GOLD

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PRICES GREATLY REDUCED.

Only Refined Silver and Best Copper used, Over 3000 Orders filled. Fifteen Medals Awarded. Old Mining Plates can be Replated, Old Plates Bought, or Gold Separated.

These Plates can also be purchased of **JOHN TAYLOR & CO., Corner First and Mission Sts**

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Our Platee have been ueed for 20 yeare. They have proved the beet. We adhere etrictly to contract in weight of Silver and Copper. SEND FJR CIRCULAR.

IMPROVED BELT FRUE ORE CONCENTRATOR.

The Best Ore Concentrator in the market, having double the Capacity and doing its work as close as the plain Belt machine, while its concentrations are clean. It is used in a number of Mills, the most notable of which is the Alaska M. & M. Co's Mill, where 24 Improved Belt Frues are taking the Pulp from 120 Stamps, crushing 350 tons per day, and is giving entire satisfaction as against 48 plain Belt Machines, taking the Pulp from the other 120 Stamps.

Price of Improved Belt Frue Vanner, $825, f. o. b.
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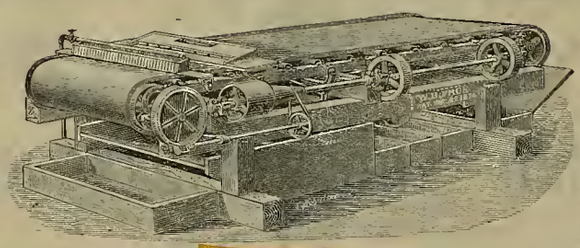
For Pamphlets, Testimonials and further information apply at office.



Protected by Patents Decemher 22, 1874; September 2 1879; April 27, 1880; March 22, 1881; February 20, 1883; Septemher 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MA... 15, No. 132 Market Street, San Francisco, Cal.

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(INCORPORATED SEPTEMBER 29, 1882.)

Nos. 39 to 51 Fremont Street, - - - - - - - - - - San Francisco, Cal.

Manufacturers of NEW and Dealers in SECOND-HAND BOILERS, ENGINES, PUMPS and MACHINERY

OF EVERY VARIETY.

Steam Pumps of all Makes,

CENTRIFUGAL PUMPS,

MINING PUMPS.

BLOWERS AND EXHAUST FANS.

LEATHER and RUBBER

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Stationary, Portable, and Hoisting

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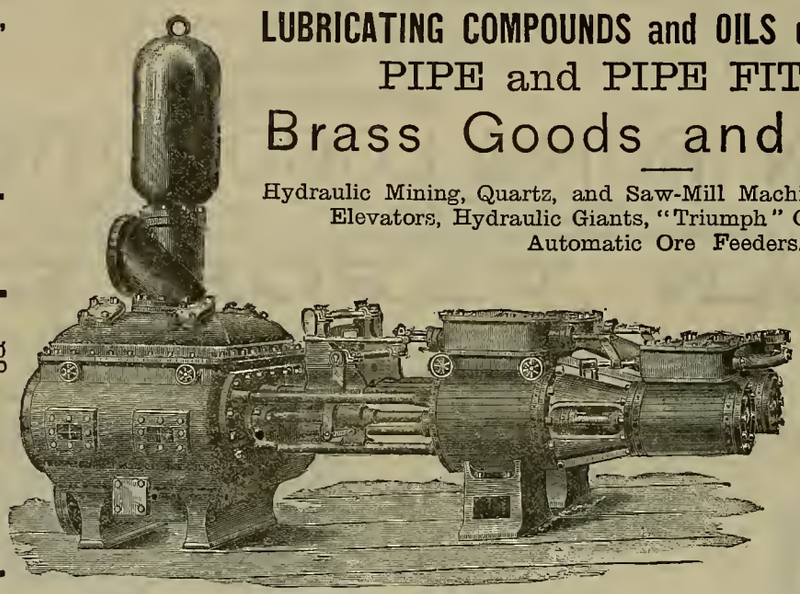

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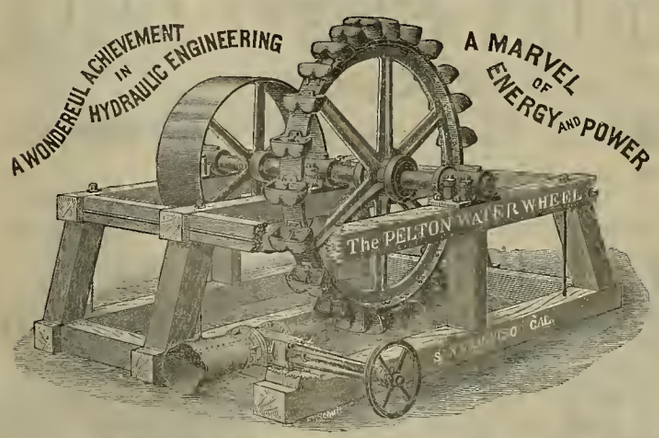
"Eclipss Corliss" Enginss, "Russsll" Automatic Enginss, "Climax" Band Saw-Mills, "Economizsr" Boilsrs and Enginss, "Eris Engins Works" Boilsrs and Enginss, Trsnton Iron Works Spscialtiss of Wirs Ropes, Garlock's Elastic Spiral Packing, "Baksr" Rotary Prsssurs Blowsrs, Rotary and Centrifugal Pumps, Buffalo Duplsx Stsam Pumps, Exhaust Steam Injsctors, Automatic Rs-Starting Injectors, Machinists' Tools of all Styles for all Work.

THE PELTON WATER WHEEL

GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD.


A WONDERFUL ACHIEVEMENT IN HYDRAULIC ENGINEERING
A MARVEL OF ENERGY AND POWER
The PELTON WATER WHEEL
SAN FRANCISCO CAL.

OVER 800 ALREADY IN USE.

Affords the Most Simple and Reliable Power for all Mining and Manufacturing Machinery.
Adapted to heads running from 20 up to 2,000 feet.
From 12 to 20 per cent better results guaranteed than can be produced from any other Wheel in the Country.

ELECTRIC TRANSMISSION.

Power from these Wheels can be transmitted long distances with small loss, and is now extensively used in all parts of the country for generating both power and light.

APPLICATIONS

Should state amount, and head of water, power required, and for what purpose; with approximate length of pipe; also, whether the application is with reference to *Wheels* or *Motors* described below. SEND FOR CIRCULARS.

The Pelton Water Wheel Co.

121 MAIN ST., SAN FRANCISCO, CAL.

PELTON WATER MOTORS.

Varying from the fraction of 1 up to 15 and 20-horse power. Unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. ☞ SEND FOR MOTOR CIRCULAR. ADDRESS AS ABOVE. ☜

THE GATES

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—IS—

THE MOST IMPORTANT IMPROVEMENT

That Has Ever Been Made in This Class of Machinery.

IT WILL DO MUCH FINER WORK

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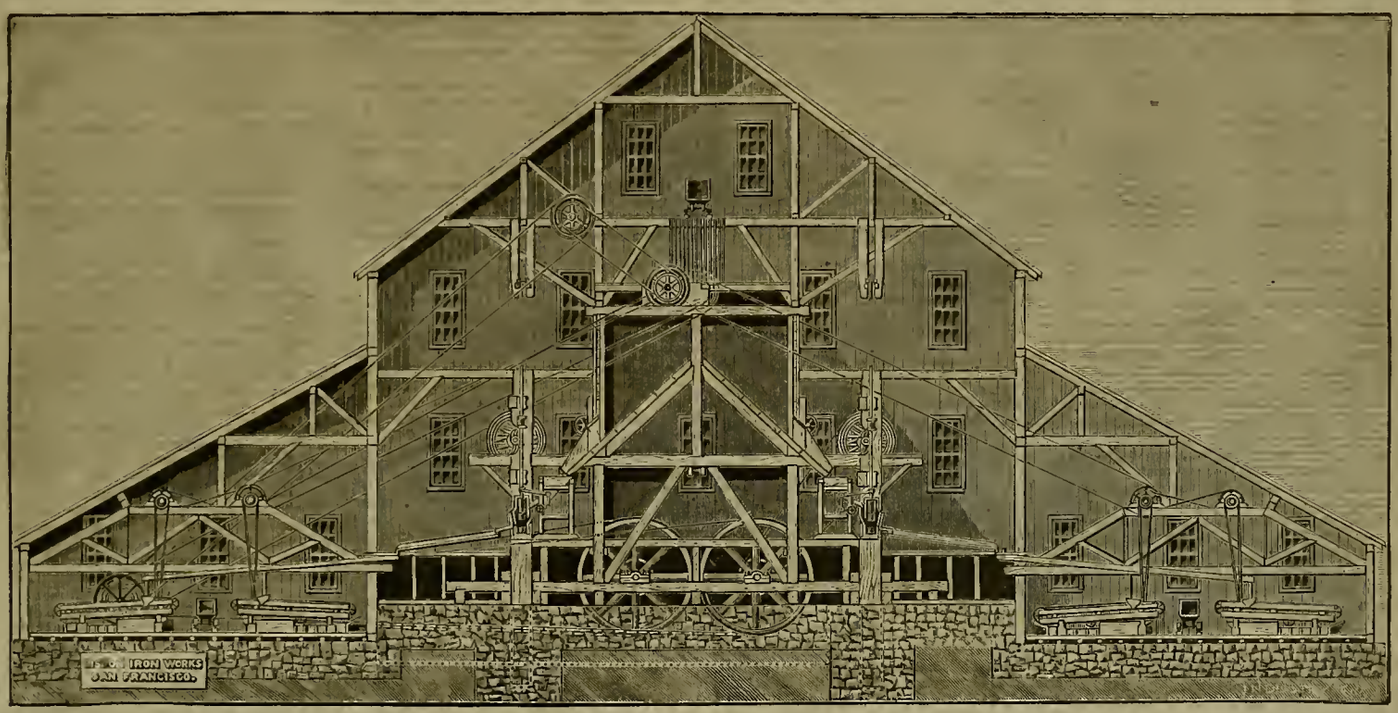
MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 12
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, SEPTEMBER 20, 1890.

Three Dollars per Annum.
Single Copies, 10 Cts.



THE 240-STAMP MILL OF THE ALASKA MILL AND MINING CO., DOUGLAS ISLAND, ALASKA.

Marshall's Window-Sash Balance.

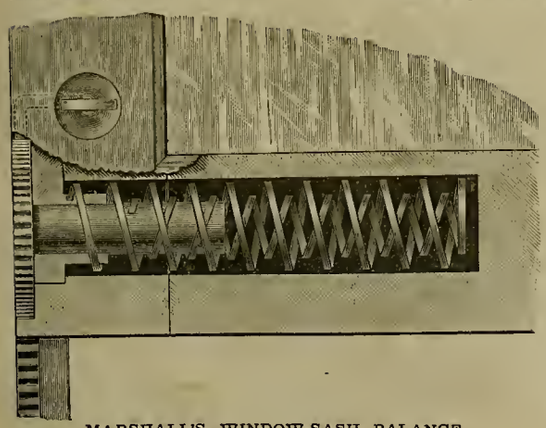
The device herewith illustrated was invented by Dr. Benjamin Marshall of San Francisco, and is designed to take the place of the present cumbersome window furniture, doing away with the boxes in the sash, the weights, cords and pulleys, and also the lock at the meeting rails. It is as much superior to the old-fashioned furniture as the Hartshorn shade-roller is superior to the cord-pulley of other days.

The operation of the device is due to the reciprocal action of the spring and pinion, the latter of which, engaging the rack and rotating as the sash is moved down, effects the winding up of the spring, and the spring thus wound serves to rotate the pinion when the sash is moved up, the whole thereby performing its function of a sash balance.

The device has been in active use over Dr. Marshall's entire house for a year past, and works more smoothly to-day than ever. A company has been formed, called the Marshall Improved Window Furniture Co., with a capital of $1,000,000, with $250,000 paid up. A plant has been established at 126 Main street, this city, to supply California, and is now in running order and turning out about 200 complete windows per day. The device has been ordered into the new Mills building, the Crocker building and the Doe building (Hayes and Market); also into the State Insane Asylum at San Bernardino and the new courthouse in Los Angeles. Various residences now building in San Francisco and its immediate vicinity have made application for the device and will be supplied by the company to the extent of its capacity.

The beauty of this device is that it can be applied to old windows as well as new, and the company has standing orders to refurnish many old buildings

The officers of the company are: C. F. Crooker, president; C. Josselyn, vice-president; J. de W. Allen, Secretary.



MARSHALL'S WINDOW-SASH BALANCE.

THE population of the State of Colorado, according to the count of the Census Bureau, is 410,973. This is a net increase during the decade of 216,543.

The Largest Quartz-Mill.

The largest quartz-milling plant in the world is that of the Alaska M. & M. Co., Douglas Island, Alaska. It has 240 stamps of 850 pounds each, 6 rock-breakers and 96 concentrators, and is capable of reducing 600 tons of ore in 24 hours. The mill is driven by water-wheels during the wet season, and there are steam engines for use when water runs short. Each plant has 400 horse power. This mill was built by the Risdon Iron Works of this city, and was at first 120 stamps, but this number was subsequently doubled. The cut on this page shows a cross-section through the mill.

THE California World's Fair Association has been permanently organized.

THE CORN PALACE OF 1890.—See page 190.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Comstock Mine Management.

The Hale and Norcross Ore Assays.

EDITORS PRESS:—Toe Virginia *Chronicle* and *Territorial Enterprise* of Sept. 9th both publish articles in defense of the methods pursued on the Comstock in mining and milling.

The *Chronicle*, under the head of "Local Mining News," gives utterance to assertions that will astonish practical miners and make shareholders in Comstock mines understand that the mines in which they are interested are run for the benefit of the mills and not of the shareholders. It says, in referring to the drafting of 60 men from the Hale and Norcross mine:

"The regular prospecting development of the mine goes on energetically and is directed to searching for deposits of good ore to average up the low-grade ore with—a proposition which holds good and judicious in experienced Comstock mining."

It would seem that the gentleman who penned this paragraph made a slight mistake. He should have said that the recently published articles in reference to the management of the Hale and Norcross mine had caused the parties in charge of that property to stop their illegal practices for awhile.

This association has in its possession the official assays taken from the 800, 900, 1000, 1100 and 1200 levels of the Hale and Norcross mine, and as these assays go as high as $600 per ton and are numerous, the statement made in connection with the drafting of these men is simply nonsense.

The *Territorial Enterprise*, in its defense of the mismanagement of the Comstock mines, gets still deeper in the mire.

Their defense of the grading of ores down to a value that makes dividend-paying ore a milling proposition, and causes the levying of assessments to extract them, is the first admission ever made to stockholders that they were paying assessments for the benefit of the mill ring. If this admission was alone the truth, it is sufficient to prove the criminality of the managers of the Comstock mines; but it is not all, for it can be proven, and the proofs are in the possession of this association, that they have deliberately and continuously and feloniously made away with the bullion output from certain mines. There has never been any opposition or objection to the legitimate grading or mining of ores, but the shareholders of the Hale and Norcross object to grading high-grade dividend-paying ore down to a point where it causes a loss to the company and then levying assessments to make up the deficit. If this is not criminal mismanagement, what is?

The mine managers know that they have been guilty of the most outrageous and illegal acts possible. They know that for years they have impoverished the miners on the Comstock lode by appropriating the pay ore on which the miners on the lode have bought and held mining stocks. Their positions in the mines gave them the knowledge of important developments and the ore discovered has been spirited away under their very noses. It is farcical to see these mining managers squirming and posing as the miners' friends. They claim for themselves that by grading the ore down they have made more work for the honest miner. The fact is they fed him with a cocktail spoon with one hand and disemboweled him with the other.

Here are a few figures for the consideration of the honest miner. These figures are from the official assays of the Hale and Norcross mine, made under the direction of the superintendent in 1889:

	Cars.	Per ton
Feb. 17..	2	$ 24 30
	27	39 95
	130	44 76
" 18..	4	340 00
	31	87 31
	108	35 95
" 19..	3	208 00
	2	23 00
	38	38 84
	135	36 40
" 20..	5	224 00
	25	57 24
	125	93 00
" 21..	2	207 00
	25	42 82
	144	30 42
" 22..	5	165 00
	21	50 14
	30	29 92
" 23..	12	287 00
	30	31 12
	45	21 12
" 24..	6	212 00
	31	49 72
	112	34 89
" 25.	Assays miss ing.	
" 26..	8	240 00
	20	72 30
	58	32 34
" 27..	4	31 90
	41	27 18
" 28..	9	34 40
	53	20 39
	5	6 60

The pulp or battery assay for the week ending Feb. 18, 1889, was $21.78 per ton, and for the week ending Feb. 25, 1889, was $25.19. Deducting 30 per cent from these pulp assays gives 15.25 and 17.64 per ton respectively, or an average of $16.44 per ton, which went to the shareholders in the mine.

Can the honest miner find in the above any special evidence of grading that benefited or enriched him?

The fact is, the rock *was not* graded, and, as can be seen, very little of the metal contained in it went to the benefit or profit of the shareholders of the Hale and Norcross Company.

The Virginia papers in their various articles treat the matter of the looting of the mines with great levity. Apparently they have lived in that peculiar atmosphere so long that they are accustomed to it and can see no wrong in the acts that are considered so by others. Possibly the film may be withdrawn from their eyes in the future, and then they will see the unhappy place they occupy in the view of other men.

They seem to forget that it was the money of the shareholders on the whole Pacific Coast that developed the Comstock by continuously paying assessments through all these weary years. They seem to have forgotten that these shareholders are entitled to be considered when pay ore is found. They may have the privilege of paying assessments to find pay ore, but when found must not share it.

The Virginia City papers say that the miners are satisfied; that *they* make no complaints against the gross outrages perpetrated on the Comstock lode. This is absolutely untrue. These outrages have been continuously denounced in secret by the miners, but they know that their bread and butter and that of those dear to them is dependent upon their silence, and they put up with these wrongs and oppressions rather than make their innocent ones suffer.

What a humiliating spectacle is this exhibition of willing servility by these papers! The Czar of Russia and the King of Dahomey rule their possessions with the same gentleness that characterizes the rule of the mill ring on the Comstock, and the unfortunate miner who incurs its displeasure can get out of the camp or starve.

Perhaps the newspapers are in the same position and should not be blamed for their loyalty to the side they advocate. Yours truly.

MINING STOCK ASSOCIATION.
By J. H. TINGMAN, Vice-President.

Wonderful Trees.

EDITORS PRESS:—The subject of *wonderful trees* is an almost inexhaustible one, abounding in interest and curiosity. In our own State are found the most famous groves of gigantic trees in the world, perhaps. One who visited the Mariposa Grove last year writes: "They are not trees at first sight. You can neither measure them with your eye nor sit in their shade—only take in a portion of the brown trunk as large as a good-sized house. It is only by an unusual effort of looking up that we see either foliage or limbs. They are not beautiful—simply enormous."

Imagine one tree measuring 90 feet in circumference; this is true of "Grizzly Giant." "Wawona," sometimes called "Tunnel Tree," has a roadway cut through the solid heart which is 27 feet through, 10 feet high and 10 wide, and yet the tree is vigorous and growing. There are many others equally as wonderful in this famous California forest.

The cypress, in ancient times, was considered a sacred tree, and idols were carved from it. The Pacific Coast Indians were found using it in their ceremony of purification in their wildest savage state.

The mulberry has been called the wisest of trees from the fact that it never puts forth its buds and leaves till the season is so far advanced that there is no inclement weather to be apprehended.

Rosewood is said to owe its suggestive name to the fact that when the tree is first cut the fresh wood possesses a very powerful rose-like fragrance. There are several varieties of this wood and all very valuable.

The Quinneplac oak at Woodbridge, Conn., which was cut in 1882, was pronounced the oldest tree on the Atlantic Coast. Gen. Lafayette and other officers of Washington's army once rested under its spreading shade while on the march, and a visit to the tree by Woodworth is said to have inspired the poem, "The Old Oaken Bucket."

In front of Macedonia Church, in Columbia county, Georgia, is a quivering tree. Every limb, large and small, on the tree trembles as in fear, or as a suffering animal would quiver, and this occurs when not a breath of air is stirring.

The Scotch fir is a blessing to the country in which it grows. The poor man's hut is lighted by torches made of the branches, which burn most brilliantly owing to the resinous nature of the wood. In the barren parts of Sweden and Lapland the peasants select the oldest and least resinous of the branches, take out the inner bark, which they grind and mix with their scanty supply of meal, making it into cakes called bark-bread.

In the islands of the West Indies grows a tree resembling an apple tree in hight and size, known as the calabash tree. It has wedge-shaped leaves, large, whitish, fleshy blossoms that grow on the trunk and big branches. The fruit is much like a common gourd, only a good deal stronger, and often measures 12 inches in diameter. The hard shell of this is cut into various shapes by the natives and is sometimes handsomely carved. It is made into drinking-cups, dishes, pails, and even pots, and can actually be used over the fire for boiling water. But the calabash pot gives out after a few trials over the fire, and is unfit for further service.

Probably the only trees which grow ready-made whistles are those found in the forests of Nubia. When this tree is swayed by the wind, strange sounds may be heard like the notes of a flute, a fife, or a penny whistle. The vocal tree was a wonder to all who heard the mysterious sounds, until explanation was given by a scientific traveler who investigated the matter. He found that at certain seasons of the year hordes of insects deposited their eggs on the young shoots and ends of branches. When the young insects emerged, small holes were left in the galls. The wind blowing through these openings caused the strange noise.

In New Zealand is a tree fatal to birds. The seed vessels give off a sticky fluid, and many a fly finds himself on the gummy stuff. These flies attract small birds, and they too get so covered with the fluid that they are unable to fly. They are also attracted by the clusters of ripe fruit, which they intend to eat, but when once covered by this fatal gum they remain, not to eat, but to be eaten by other animals.

The most important article for illuminating purposes in Japan is the candle made from the fruit of a tree which very much resembles the common sumac of this country, and is called "the vegetable wax tree." The berries are the size of a small pea, of a whitish color, hanging in clusters, and contain the wax as a thick, white coating of the seed. The wax is obtained by the berries being crushed, strained and pressed in hemp-bags, or by boiling the bruised seeds and skimming the wax from the top. From experiments made, this tree can be readily grown in this country. It is highly ornamental as well as valuable for its production.

In a part of Africa not frequently visited by travelers, the discovery has been made of a tree which yields butter. Under no system of treatment can it be made to equal that churned from milk, but by salting it is somewhat similar. By heating with a solution of potash or soda it is easily converted into soap.

The "stinging tree" of Queensland is a luxurious shrub, pleasing to the eye, but dangerous to the touch. It grows from two or three inches to 10 or 15 feet in hight, and sends forth a very disagreeable odor. Its effects are curious; it leaves no mark, but the pain is maddening, and for months afterward the part when touched is tender in rainy weather or when wet in washing.

A marvelous palm grows in the village of Pedur, in India. Some children plucked its fruit at five o'clock one afternoon and flocked early the next morning to gather more, but they found the branches now far above their heads. Observation showed that the tree had been changing its position every morning and evening. It is 11 feet in hight. One who has seen it writes: "At 5:30 the tree was almost lying toward the west. The foot of the tree was at an angle of five to seven degrees with the ground, and we were given to understand that it had already commenced to rise from four o'clock. A handkerchief which had been tied to one of the leaves, so that its other end just touched the ground, had risen six inches. At 8 P. M., the handkerchief was eighteen inches from the ground, and at 3 A. M., nine feet."

One of the greatest wonders of Madagascar is the "Traveler's Tree." Its stem resembles that of a plantain; but it sends out its two wing-like leaves (which resemble a large expanded fan) on opposite sides of the stalk. In an aged tree the lowest of these leaves will be from 20 to 40 feet from the ground. The fruit grows in large bunches, with three or four such bunches to a tree. The leaves are used for roof thatching and the leaf stalks twirled together serve for the walls of the islanders' huts. The most remarkable property of this, and the one which gives its name "traveler's tree," is its leaf stalks, which, even in the driest seasons, always contain water; and the wayfarer, if he be thirsty, has only to pierce the thick base of a stalk to obtain fully a quart of pure and refreshing liquid.

Newton, N. C., has a curiosity that beats by a large majority the rain tree which gained such notoriety in Charlotte in 1886. It is a smoking tree, and baffles all efforts at explanation. It is a white mulberry tree, was brought from Illinois a year or two ago, and is now about 12 feet high, with a bushy top and many lateral branches. Puffs of smoke, identical in appearance to cigarette smoke, are seen starting every now and then from all over the tree; sometimes from the leaves, sometimes from the bloom, sometimes from the bark of the limbs or trunk. The puffs are at irregular intervals; sometimes two or three at once from various parts of the tree, and sometimes they are several seconds or a half minute apart. They just come haphazard from any part of the tree, and as they ascend in the air, look exactly like the smoke from a cigarette.

Professor Sohelwisch, the well-known naturalist of Bavaria, while traveling with the Stanley expedition in the heart of Africa, noticed a plant with a peculiar steel-colored foliage. It was growing like other plants from the soil, but on examination was found to be practically composed of iron. The leaves, although very thin, were bent with great difficulty, and in order to secure one, it was found necessary to separate it from the branch with a file. On further examination and experiment, it was found that the plant, or tree, eagerly devoured any metal its roots might come in contact with, and changed its color to the color of the metal last absorbed.

Major Quincy A. Steele, who has been with an engineering corps surveying railroads in Central America for the last two years, gives an account of some very curious trees he met with there. Among the funniest are the electric light tree, a tree which gives milk, and the dough-producing tree. The electric-light tree gives a light so strong that you can read or write by it by night; this tree is not a large one but very conspicuous, and scores of them may be seen over the country, like beacon lights set in the hills.

The milk tree has a big tough skin that can be used for half-soling shoes. To milk the tree, a hole is bored in the trunk; then it lets down sap as white and as sweet as any ever milked from a cow.

The bread from the *bread tree* is not exactly bread when picked, but is a nice stiff dough inclosed in a nutshell about the size of a goose egg. The nut is cracked, the dough taken out and kneaded a little, then is ready for baking. By thinning it down with a little milk from the milk tree, it makes excellent pancakes.

In behalf of those who are interested in trees, I have collected the foregoing from what appears to be reliable literature, and without doubt truthfully describes these forest wonders.

National City. F. L. E.

Forestry and Railroad Ties.

Bulletin No. 4, just issued by the Department of Agriculture, Forestry Division, is a sequel to some previous publications of the division which discuss the relations of railroads to the wood supplies of the country, with reference to the conservation of our forest areas. It contains a brief discussion by the chief of the division, setting forth, upon the basis of a recent canvass among the railroad companies, the enormous consumption of wood material for railroad construction, and especially showing how future supplies are being endangered by the use of the most valuable timber and of the young growth. To satisfy this demand requires the annual culling of the best timber from probably more than 1,000,000 acres of our natural forest lands. The chief value of this part of the bulletin consists in the directions which are given for increasing the durability of wooden ties. These are found to last on an average less than seven years, so that for replacement alone an annual cut of 80,000,000 ties is required. By lengthening the life of the tie a single year, it is evident that a considerable saving would be effected, tending to reduce transportation charges and also to husband our forest supplies. For lengthening the durability of ties, various means are suggested, among which are the selection of lasting timber, proper care in the seasoning of material, attention to the drainage and ballast of the roadbed, precautions against fungi, improved methods in fastening rails, and various preserving processes, some of which are new. The information here furnished is likely to be of value to any consumer of wood material.

The bulk of the bulletin is taken up by a report of R. E. Tratman, C. E., collating the experience of the world in regard to the substitution of metal for railroad ties. It had been stated hitherto that metal ties were used experimentally, but that the time for their introduction was still far distant. This report shows that not only are there something like 30,000 miles of railroad track of the world laid on metal ties, but that where these ties have been used most extensively (namely, in Germany, India and the Argentine Republic), they have shown themselves superior to wooden ties in producing a safer, more permanent, and in the end more economical track. The report is exhaustive, full of the detail which alone can make it valuable to the engineer, and promises to be an important aid in the solution of the metal-tie question, which in this country has received little consideration, from the belief that it is either impracticable, or, with our seemingly inexhaustible timber supplies, premature. The use of the metal tie is expected to economize wood supplies, and by its cheaper maintenance and other favorable features, to reduce transportation charges and increase rapidity and safety of travel.

Mexican Mines.

An old-time miner, who is now living in the City of Mexico, has the following to say about the mines of the Southern Republic: I began mining in 1852, in California, and I have been engaged in mining ever since. I have lived here, studied the country, invested hundreds of thousands of dollars in mining, and have good reason to be satisfied. The country is not a tenth part prospected. There are great numbers of rich mineral deposits unworked. It is the land of the modern miner working according to scientific methods, and with the most improved machinery and implements. The railways have made it possible to work mines which formerly were practically inaccessible. It is as safe a country as any part of the Western United States. We have had ample protection from the authorities, and we shall now put fresh capital in here. The movement of New York capital this way in quest of good mining properties has only begun.

In fact, there is an abundance of money in New York City if you can show really valuable properties, but the Mexican owners of mines must give up their exaggerated expectations.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER VI.

[Written for the Press by James H. Crossman.]

Auriferous Gravel.

Lyth creek, 13 miles northwesterly from Colton, Sec. 27, Tp. 2 N., R. 6 W., has an average flow of 1300 miners' inches, of which 1000 inches is utilized by ranchmen for irrigation, and 300 inches for mining purposes. The fall of the creek for the first four miles is 200 feet to the mile; for the remaining distance the fall is 120 feet to the mile. On both sides of the creek the banks are lined with auriferous gravel, in many places 200 feet thick, which has been worked off and on for the past 30 years by both the hydraulic and the drift process. It is estimated that several hundred thousand dollars have been extracted from these mines. At date, however, the most available and accessible points have been exhausted and mining is now conducted in a weak, desultory manner, the want of water for hydraulicking being a serious drawback.

The Granite range is six miles long by three-fourths of a mile wide, coursing nearly northerly and southerly. On both the east and west banks, channels have been eroded—three channels in all. The west side shows a depth of gravel from 50 to 100 feet above its bed, much richer than its eastern companion. The richest pay is found on the rimrock between the old channels and the creek.

George Turk's placer claim is situated six miles from the mouth of the canyon (at an elevation of 3150 feet) on the east slope of the mountain near a spot known as Glenn's ranch, 18 miles north of San Bernardino. This mine was located in 1867, and has been worked irregularly ever since; the water is taken out two miles above the river, using 300 miners' inches. The gold is coarse nuggets, and its mint value is $19.10 per ounce. Good prospects can be found on the east slope of the hill 300 feet above the bedrock of the creek.

At Glenn's ranch, Tp. 2 N., R. 6 W., Sec. 22, S. B. M., a vein of gold-bearing quartz occurs which gives a good prospect in the horn spoon, but with no other work of development than a six-foot shaft. On the headwater of Lyth creek and its tributaries, numerous small gold-bearing veins occur on which but little development has been made. At Hot Springs, at an elevation of 2605 feet, a quartz vein crosses the traveled road on which an open cut has been made. The vein is from three to four feet in width, carrying both gold and silver assaying from $5 to $10 per ton.

Pliocene Gravel.

On the westerly slope of Antonio Peak, at an elevation of 5140 feet, a dead-river channel containing auriferous gravel was discovered in the summer of 1882 by Messrs. Amee and Henderson. The channel bed is filled with auriferous gravel, dissimilar in every essential particular to the alluvium that fills modern rivers. Judging from developments in the bed of this ancient river channel, it flowed from the north, bisecting the range at this point. The lowest point of the channel on the southerly side of the mountain shows an elevation of 5140 feet above tide-water. From this point southerly to the ocean, 48 miles distant, the grade is precipitous. In the first 15 miles the fall is 512 feet to the mile (the elevation being 457 feet). The remaining 33 miles to tide-water we find a fall of less than 14 feet to the mile. On the northerly flanks of the mountain range we find (estimating the level of the channel bed, not allowing for grade,) that we reach the Mojave desert in a descent of 5403 feet. The elevation at a point opposite is 2737 feet; distance, 18 miles on a horizontal line.

There has been a subsidence of large areas of land in the valley and desert regions lying both north and south of this range, as is generally acknowledged by writers and scientists. Previous to this event, in all probability the valley and its shore line extended southerly and westerly from 60 to 70 miles farther in this direction, at least as far as San Clements and San Nicholas islands, to say nothing of the Channel islands, on which have been found remains of the mammoth mammal (vide Prof. Le Conte). Vast quantities of auriferous gravel are found on the southerly flanks of San Gabriel mountain, extending in places as far as the Pacific ocean. In many places the bluffs on the beaches are entirely composed of gravel resembling the bluff on each side of the mouth of the Klamath river.

This Antediluvian Water-Course

Is old, very old. It is aristocratic and high-toned, living way up in the snow-clad Sierras, but has seen better times and a warmer clime, judging from the fossil branches and trunks of trees that have recently been found in its bed. It was of mammoth proportions in keeping with the monster brutes that once roamed on its banks and laved in its waters, their remains still being found at lower elevations (vide Prof. Preston's, p. 202, Ninth Annual Report of our State Mineralogist).

But to return to our mutton. The gravel in the channel referred to resembles the Pliocene gravel-beds that are so extensively worked in the middle and northern counties of our State. The gold is of a peculiar shape and color. It is of a greater fineness (in excess of 900) than any gold found in modern rivers, unless derived from the class of channels referred to. The channel in question is being developed by three companies, each holding 1500 feet of frontage, extending back to the center of the divide. Both the hydraulic and drifting processes are used in developing these mines.

At the Head of San Gabriel Canyon,

Northwesterly from this point and at about the same elevation, the same character of gravel occurs, apparently an outbreak from the main lead. This class of gravel can be traced down the San Gabriel river to its mouth at a point southwest of Los Angeles for a distance of 30 miles. Below San Pedro, fronting the ocean, the gravelly bluffs of the shore line rise to a hight of 75 feet and extend for four miles.

The gravel-banks on the San Gabriel river are known to be rich, and several companies have been formed to work them, but for some reason unknown to the writer the projects have invariably fallen through and no active work commenced.

The Bald Mountain

Gold mines are in successful operation. The width of the channel-bed has been proved by crosscuts, and found to be from 200 to 250 feet at its lowest point in the center, with gradually-raising rims on either side. That portion of the channel that is being hydraulicked is from 30 to 200 feet in hight. The present workings are on the westerly rim of the channel. The course of the channel is northwest and southeast.

Water is obtained from the melting of snow, which is caught in storage reservoirs of small dimensions, and used under a 300-foot pressure through a 6-inch pipe, with a 2½ and 3-inch nozzle. The seasons are necessarily short, commencing in May and ending in November. The gravel first passes over a grizzly; thence through three 16-foot boxes, 16 inches wide and 24 inches deep, set at a 16-inch grade to the box. Quicksilver is not used on the boxes or ground-sluices, but in the undercurrent. The boxes contain riffles, 2x4, set at a sharp angle, 1½ inches apart. The mine is only worked in the daytime, but the yield is reported to be $8 per day to the hand; only six men are employed.

Bear Valley

Mining District is located on the southwest corner of Tp. 3 N., R. 1 E., and in the southeast corner of Tp. 3 N., R. 1 W. Here large areas of gravel occur which have been worked in an irregular manner by Mexicans who have, it is reported, drifted out the most valuable and accessible portion of the rich gravel that lies on and near the bedrock, and extracted large sums of money. The upper stratum to the surface is abundantly rich providing water could be obtained to work by hydraulic process under a sufficient pressure head. In 1886 and 1887 a large portion of the basin was sold by Alexander Del Mar to an English company. A corporation was formed under the name and style of the Valley Gravel (limited). The work of development was inaugurated by driving a long drain tunnel with so little grade and so near the surface that it was found valueless. The bedrock gravels exhausted, and sufficient head could not be obtained to work them owing to their great elevation. The work, however, is still being prosecuted.

Ruby Mining District.

On the east end of the Bear Valley range of mountains, where Cook and Rattlesnake canyons intersect, a flat has been formed of about three square miles covered with auriferous gravel of an unknown depth. The center of the channel never has been reached, although shafts have been sunk to depths of from 60 to 100 feet. The gravel on the rising bedrock is extracted and dry-washed, there being no water in the vicinity. This flat has never been prospected by other than Mexicans. It is reported that by this slow process $8 per day to the hand is not uncommon. The gravel is reported to be abundantly rich if there was water on the ground. The district derives its name from the large number of small rubies and garnets that are found with the gravel, it not being uncommon to get two tablespoonfuls of these stones from a single pan of earth. They are too small, however, to be valuable as gems.

Holcomb Valley

Mining District is situated in Tp. 3 N., R. 1 E., at an altitude of 7500 feet. The district embraces both gold-bearing quartz veins and placer mines. Prior to the year 1873, these mines were principally worked by Mexicans using the arastra process. In 1873, Barney Carter made the discovery of heavy outcrops of a strong and well-defined vein of gold-bearing quartz, coursing N. 40, W. and S. 40 degrees E. The discovery was made on the southeast corner of the above-mentioned township. He made three locations—the Rainbow, Littlefield and Moonlight.

Other discoveries followed, and about one mile farther north, five other locations were made on croppings that occurred on the same line of strike. These last are respectively known as the Last Chance, Cynthia, Morrison, Gulch and Hub, all of which are held by the present owners under a United States Patent. In 1873, E. J. Baldwin, Samuel T. Curtis and others of San Francisco purchased a portion of this property and erected a 10-stamp mill on the Rainbow, and after incorporating the three first-named mines made a stock deal, floated the stock and made a run of the mill. The rock crushed is reported to have paid $10 per ton. Shortly after the mill burned down, work was suspended, and never has been resumed. United States Deputy Surveyor Wm. J. Reynolds, by whom these mines were surveyed for patent, in his official report to the U. S. Surveyor-General, says: "The gold-belt is about three miles wide, having a general northwest and southeast trend. The altitude by aneroid at the Rainbow was found to be 8000 feet, and at the Cynthia 7000 feet. The geological formation on the southwest side is of gneiss flanked by micaceous granite, and that on the northeast side by metamorphic slate, in turn flanked by a talcose schist; the latter rock by granite, with an overlying deposit of limestone. The thickness or strength of the vein is from 20 to 40 feet, with a northerly dip of 84 degrees. Its gangue, granular quartz, hanging-wall serpentine, and footwall metamorphic slate." Capt. Peter Mackie of San Francisco furnished the writer with the following description of the

Green Mine.

1500x600 feet patented, situated in Holcomb valley. It is developed by shaft 210 feet deep from bottom; a lateral drift has been driven 310 feet, vein from 1 to 5 feet in thickness. From end of lateral drift a winze has been sunk which exposed four feet of good ore in its bottom. An adit can be driven 700 feet below on the line of the croppings, giving 300 feet of additional backs. Grade of average ore $25 per ton; water in the vicinity sufficient for 40 stamps.

Three arastras have just been completed and are ready to start on the ore. Quartz from the mine has been shipped to Daggett and elsewhere for tests, which have given good results. Sawmills in the vicinity furnish lumber at $10 per M. The divide lying between Bear and Holcomb valleys is covered with a dense growth of pine suitable for lumber, which is being utilized by mills in the vicinity, finding a ready sale for their product in the valley towns.

(To be Continued.)

The Demand for Mines.

We believe, says the Eureka *Sentinel*, there is going to be a good demand for good silver mines in the near future. We have advices from New York and Boston which seem to point strongly that way. Eastern capitalists are tired of real estate and real estate booms. They are also tired of loaning on farm mortgages. Millions of New England money has been invested in Kansas and other agricultural States on real estate securities. On most of this money not a dollar of interest has been paid in three years. The Chicago grain market and the New York cotton and railroad exchanges are considered too risky by the general run of conservative investors. What other field, then, is left except mining? With prudence, mining may be as safely followed as any other line of business. It is the most fascinating pursuit in the world. It unwinds hopes and possibilities not realized in any other industry under the sun. It is the most independent occupation on earth. A man with a good mine never has to drum for business. It is he who is drummed by the tradespeople for his business. Personally we would rather have a good mine than any number of ranches in any State in the Union. A mine is a clean-cut proposition that yields up the hard cash, without trouble with book accounts, time notes and slow collections. It is the business, over and above all others, that stimulates all other branches. The great wonder is that more men of ample means do not occupy themselves in this highest type of industry.

The chief reason why they do not grove out of the fact, doubtless, that they do not understand it. It is a big job and a long job to convert an Eastern capitalist into the belief that a silver mine is a good thing to have. The closing down of other avenues of profitable employment for their money will bring them around to the point of investigating for themselves sooner than anything else; and when once their attention is arrested they will not be long in putting in their money. This is the basis of our best hope for money with which to develop our long-neglected mineral resources. There are good mines and good prospects. A prospect is not a mine, but the prospect must always precede the mine. Good mines are scarce and hard to find. They are worth good money when found. Promising prospects are plentiful. Here is the place to draw the line. Too many mining operators palm off mere prospects on the unwary as established mines. This has been the vice of the mining business all through the West. It has disgusted and repelled capital. Honesty should be the rule in everything. It applies to mines and mining as to everything else in life. If you have only a prospect, say it is a prospect and sell it as a prospect and nothing more. Then no one will be deceived. The business of enlisting capital for mining is a tedious undertaking and full of disappointments, but we believe it is going to get easier right along until we have renewed activity all though the mining regions of the West.

THE MOUNTAIN SPRINGS.—Though the greater part of the snow deposited in the mountains last winter has disappeared, we are still deriving full benefit from it. The water from the melting snow descended into the ground and into the fissures of the rocks, and is now feeding all the mountain springs. Instead of shrinking in volume or going dry, as usual in recent years, these springs continue in full and strong flow, and thus a good stage of water is maintained in all our creeks and rivers. It is thought that the renewal of life in the springs is such as will continue two or three years, even though we shall not in that time be again favored with another such mighty snowfall as that of last winter.—*Virginia Enterprise.*

The American Race.

We have none. We are one people only by law, language, industry and commerce. In all else we are wide apart. Race, color, religion, thought, habit and condition, oh, how wide apart! We are gathered from the ends of the earth and exhibit specimens of the highest and lowest degree in all.

But come back here in a thousand years and you shall find all this vanished into thin air. We shall be one race—the American race. All trace of these distinctions will have passed away. There will be only one blood, bone, flesh, color and form—the American people will be one great family.

In a thousand years the white blood will have worked down among the darkest and lowest, and the black, Chinese, Indian and other blood will have crossed and streaked the first families. They will all be one flesh and the distinctive features will have passed away.

What will that race be? White, without a doubt, from light blonde to dark brunette. But all will pass for white. The prevailing element, the wealth, education, mental force and mastery and the numbers of the whites will make them the type, the race; but all the rest will leave their mark, here weak, there strong, but seen more or less all round.

Shall we be a superior race? How shall we compare with Europe, with the English, French, or German? Will the pure or the mixed prove the superior? Will there be a white race anywhere that will loom up above us and look down upon us as we do now upon the Chinese? Who can tell? History gives us no guide, no solution of this question. Pure races yet stand at the head of civilization.

Among ourselves, blot out the white element, and we should step down from the front rank among the nations; England, Germany or France would soon regard us as an easy prey; and when the mixture is thorough, and we are one people with all this mixed blood, shall we still hold the first place or drop to a second or third, and look up to the purer blood of Europe as something away above us?

We would none of us wish to have it. We are proud and we shall always be proud to be called Americans. We would have the American race first in the world. We would all be willing to do something to make it so. What can we do?

We cannot avoid the mixture of our races. It is not possible. The proudest family in the land cannot do that. For a time, perhaps, in the end, never! Time will bring us all into one pool. Beauty, talent, wealth and erratic love will do that for us in despite of all our efforts to prevent. A thousand years is a long time.

There is probably not a man in England who could not trace his lineage to King Alfred, and also to the shepherd who kept his herd.

Again, then, the question recurs, what sort of a people shall we be in the year 3000? We are working out the problem now. We are fixing the factors. We are mixing the dough to make that bread, and settling whether it shall be white, brown or black, and what it shall be in all other respects.

If we are wise we shall be very sparing of inferior elements. We shall close our doors in the face of all who will tend to degrade us. If they come they will increase and leaven the whole lump, as we have seen. Is it not enough to make us resolve "that no more shall come to stay and live among us who will not tend to improve rather than deteriorate our general average"?

We should begin this work now. Begin with the lowest, the most objectionable, and let the work of exclusion go on till none can come among us who bring objectionable form, defect or disease.

There is no fear that our numbers will suffer by this process. Indeed it is certain that within two centuries the tide of population must set away from us, for the reason that we shall be too thick upon the ground.

God made mankind so prolific as to stand the wear of savage life in the woods, and still hold their own and increase a little all the time. When war, famine, pestilence and death by wild beasts are removed, almost entirely, as with us, we increase very fast. Some aver that we may double every 25 years, till want of space forbids.

Now let us make it 50 years, to be sure, and what remains? In 1990 we shall be 80,000,000; in 1950, 160,000,000; in 2000, 320,000,000. We shall still be less than 50 to a square mile, and may double again before the year 3000. But that will perhaps be all we can do.

Numbers are no longer an object with us, either for strength or progress; and the time is not distant when we must not only accept none from the outside, but must begin to prune those within, with a view to maintain the purity of our race and security for our peace, happiness, liberty, and our republican institutions.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

KENNEDY.—Amador *Ledger*, Sept. 13: The Kennedy mine is reported to be looking splendid. Indeed it has taken its place as one of the best hullion-producers of the county. The ore body is large and of excellent quality. The chlorination works are making satisfactory progress. Ten stamps of the Amador gold mine are kept running. Mr. Bugby resigned the superintendency of the Clinton Con. Co.'s mines near Irishtown last week, and left for the city. Robert Steveoson, the president, is now in charge of operations. The last monthly cleanup of the Wildman was one of the best ever made at this prosperous mine; rumor has it that the yield amounted to over $20,000, or $1000 to the stamp.

SUTTER CREEK.—The Lincoln mine is running along as usual, under Mr. Stewart's personal supervision, and the ore which is being sent to the bin is of the usual paying quality. Sinking at the North Star is finished. The station is cut and drifting was commenced to-day. Two drifts are to be run; one southeast, the other west. A double shift will be put on each and the work will be pushed with all possible speed. It is believed that within 12 months the fate of this prospect, which has been so faithfully stuck to by the enterprising people of Sutter Creek, will be definitely known. The Sutter Creek mine is moving along in a slow and sure style. Mortars for the mill are on the ground, and will be placed in position in a short time and the mill started up.

Calaveras.

THE PIONEER.—*Mountain Echo*, Sept. 13: The Pioneer, better known as the Tiberghein mine, west of Angels, is making an excellent showing. We were presented with some samples of the ore the other day, and judging from its appearance it is as good as any we have seen in this vicinity of late years. Hallock & Hicock are now prospecting the ore by the arastra. The ore is roasted before it is worked. By this treatment, something like a definite idea of its paying qualities can be arrived at.

Mariposa.

LUCKY PROSPECTORS.—*Gazette*, Sept. 13: Geo. Curtis and Tom Borden, two young men from the Coulterville side, came over to Whitlocks a week ago to make a raise out of some of the gulches of that locality. Last Tuesday morning the two men started for the place where Mr. Curtis had found a prospect, and in a very short time after reaching the spot, Borden, in carelessly breaking up some dirt, struck something shiny, which proved to be a 24-ounce chispa. The specimen is very beautiful, containing very little quartz, and is of the usual bright color and fineness of the Sherlocks gold. They came into town the following day and recorded their claim, which is in a little gulch east of Lyon's gulch. All of the Sherlock and Whitlock country abounds with rich leads and many fortunes have been made there, and, judging from the earnest-looking class of men now working there, more will be made. Those young men evidently are on a rich lead.

Mono.

BODIE. — *Alta*, Sept. 15: The west crosscut, 700 level, was extended 11 feet. North drift from joint west crosscut, 700 level, was extended 7 feet. Winze from No. 1 west crosscut, same level, was extended 6 feet.

MONO.—East crosscut from south drift, 700 level, was extended 10 feet.

BULWER.—Upraise from south drift, Bulwer tunnel level, was extended 11 feet.

Nevada.

THE SAUVEE MINE.—*Tidings*, Sept. 12: Supt. Palmere of the Sauvee mine returned this morning from San Francisco, where he has been consulting with members of the company who are working the property. It was decided to sink a winze from the tunnel, which is now in about 700 feet, at a point 600 feet from the mouth, and sink about 50 feet if the pay chute of the ledge is not struck before. The Sauvee is near the Empire and W. Y. O. D. mines.

CRUSHING. — *Tidings*, Sept. 11: The Crown Point mill is now running through a large crushing of ore from the Peabody mine. New pump rods are being put into the Idaho mine from top to bottom. A fine bar of silver bullion was sold to the Citizens' Bank the other day, which was taken from sulphurets at the Mountaineer mine. That property is a steady dividend-payer. A cleanup of 60 tons of ore has just been made from the W. Y. O. D. quartz mine, which yielded over $50 a ton. This ore was taken out in sinking the shaft and did not represent any ore from the drifts or stopes, and did not include the sulphurets, which are rich. The company has also just received a return from 10 tons of sulphurets that were sent to Denver for treatment, and which yielded $300 per ton. Work has been discontinued on the Menlo properties—the Homeward Bound and Wisconsin mines—and only a sufficient number of men are retained to keep the pumps going. This action on the part of the lessees is not from any dissatisfaction with the property, so it is stated, but to determine, before any further expense is incurred, as to whether the property will be taken on the terms at which the bond was given. The reports of the developments on the two mines have been of a favorable character of late.

ANOTHER STRIKE IN THE IDAHO.—Grass Valley *Union*, Sept. 13: In sinking the shaft below the No. 17 level of the Idaho mine, quartz has been found that shows well in free gold, which it is estimated may go from $80 to $100 per ton. This find is entirely disconnected from the regular pay shoot, being hundreds of feet distant from it, and may prove to be a distinct shoot. The ore is different from the heavily sulphuretted ore discovered in the same vicinity some months ago.

Placer.

THE DRUMMOND QUARTZ MINE.—*Herald*, Sept. 13: We learn from a gentleman who is in a position to know that since Mr. Wm. Werry resumed charge of the Drummond quartz mine, near Iowa Hill, he has put things in good shape and has the mine again on a paying basis. Rock is being taken from the old stopes which Mr. Werry's predecessor had condemned, and is paying well. These stopes are extensive and the vein is large, assuring rich rock for a long time. Besides these, No. 2 tunnel, now in between 500 and 600 feet, will afford new backs of virgin ore on a strong vein so rich in places as to show free gold. No. 2 tunnel has just been connected by a winze 500 feet from its mouth with tunnel No. 1, which will facilitate the working of both by affording excellent ventilation. A shaft is being sunk about 800 feet from tunnel No. 2 on what is known as the Hobson tunnel. This shaft shows a four-foot vein, also of excellent ore. In time this shaft will connect with tunnel No. 2. Until the connection is made, however, the ore from the shaft is being hauled to the mill in a dump-cart. The mine, in short, is open in good shape, and in all the openings it gives evidence of being a strong lead of good-paying ore. Mr. C. F. Reed, the owner, is to be congratulated on his prospects.

Plumas.

THE EUREKA MINE.—Greenville *Bulletin*, Sept. 10: This property is owned by a London corporation, and it is the most extensive and important in the county, employing, as it does, about 230 men and consuming directly and indirectly a great deal of the produce of the county. The mine was discovered early in the '50's, and it has been operated ever since. The property is operated on a very economical scale. John Hosking is the local superintendent and T. B. Inch the secretary. The latter has been in the employ of the company about 16 years.

FRANKLIN HILL.—This property is situated about ten miles from Johnsville, a portion of it being in Sierra county, the remainder in Plumas. It bids fair to become one of the best drift mines in the State. The Jones Bros., D. McFarlane, A. W. Sperry and others of Sierra Valley, are the fortunate owners. The mine is at an altitude of 4500 feet and consists of three locations. During the past two years, with an expense of $5300, the company took out $33,000.

OTHER MINES.—Peter Lorenzo is mining on Squirrel creek and getting good pay, likewise Nick Ross & Co. at the same place. The Fairview mine is owned by Miller & Cook of Mohawk Valley. When operated it pays well; about $8 per day to the man. The Mayflower, near the head of Mohawk Valley, is owned by Hapgood, Black & Co. They have a Huntington mill on the property, and extraction of ore will be resumed this week. The ore contains much silver, and we are informed that works for saving that mineral will be connected with the mill.

San Diego.

AT JULIAN.—*Sentinel*, Sept. 12: W. O. Havermale this week drove another spike in the wheel of progress by purchasing the High Peak mine. His purchases are for the purpose of development and will do more to make things boom than all the plotting and scheming that could be indulged in. The mine will be worked now for what it is worth, and the best wishes of the camp are extended to the purchaser.

Shasta.

MINING CAMPS.—Redding *Free Press*, Sept. 13: J. D. Campbell came down from the Silver King mine on Squaw creek Saturday. Jim is a close observer, and he has lately been looking over the various mining camps on the great mineral belt which embraces such mines as the Brown Pearl, the Niagara, the Washington, the Iron Mountain and the Uncle Sam. All the mines visited showed a spirit of activity, and many of them are putting in more machinery and extending their works. It is a self-evident fact that the mines of Shasta county are attracting the eyes of capital all over the world, and capital judiciously invested has never failed to pay.

Siskiyou.

GRAVEL.—Redding *Free Press*, Sept. 13: W. H. Fowler, the mining man, returned from a trip to Hornbrook, Siskiyou county, last Saturday. About three miles from Hornbrook are the gravel mines owned and operated by Jillson & Co. The character of the gravel in the lead upon which these mines are located is similar in every respect to the famous blue gravel lead which has paid so enormously in Sierra, Butte, Plumas, and other counties. In fact, it is even asserted that this Siskiyou lead is merely a continuation of the blue gravel channel of the counties named, being the bed of an ancient river that traversed this region in prehistoric times. Wherever the lead has been struck it has paid enormously. Jillson & Co. have taken out over $15,000 this season, and have scarcely got beyond the face of the channel.

NEVADA.

Washoe District.

OPHIR.—Virginia *Chronicle*, Sept. 13: All work during the week has been confined to retimbering the east crosscut on the 1465 level, which has been reopened and connected with the bottom of the winze sunk from the sill floor of the 1300 level. The lower part of that winze from the 108 point down was carried down with one compartment only. A second compartment will be made by raising from the bottom and then we will be well prepared to resume our prospecting work from the winze, beginning at the point—which is 108 feet below the sill floor of the 1300 level.

MEXICAN.—On the 1465 level the upraise started in east crosscut No. 1, at a point 32 feet in from the north drift, has been carried up eight feet (total hight 38 feet) in hard porphyry.

UNION CON.—On the 1465 level east crosscut No. 1, started at a point opposite the west crosscut No. 4, has been extended 10 feet (total length 782 feet) penetrating the east country rock. This crosscut has been stopped, and we are preparing to run a second crosscut (No. 2) from the north lateral drift at a point 200 feet north from the north boundary line of the mine.

CON. CALIFORNIA & VIRGINIA.—After a suspension of our mining operations for the first half of the past week we resumed extracting and shipping ore on Wednesday, the tenth instant, and there has been extracted from all parts of the mine 738 tons, which was shipped to the Eureka mill. The average assay value of all the ore worked at that mill during the last two days of the week (48 tons) was $22.25 per ton.

CHALLENGE CON.—The joint Confidence and Imperial west crosscut No. 2, on the same level, has been stopped for the present.

EXCHEQUER.—The north lateral drift on the 600 level is out 148 feet, still running in a hard porphyry formation. The east crosscut on the 500 level has its face in porphyry with clay seams.

SEG. BELCHER.—The 850 west crosscut advanced 45 feet, making its present length 120 feet; the face is in low-grade quartz and porphyry.

ANDES.—During the past week on 420 level, north drift from No. 2 crosscut was extended to 102 feet and connected with No. 2 crosscut; formation, porphyry and quartz, giving low assays. After doing some repairing will start the north drift again, which is out 212 feet.

SCORPION.—On the 600 level the southwest drift continues in a favorable formation composed of a mixture of vein porphyry with clay seams.

CROWN POINT.—Shipped to the mill during the week 259 tons 580 pounds of ore, the average battery of which was $13.75.

SILVER HILL.—The usual prospecting work is in progress on the 160, 260 and 334 levels. The vein formation on these levels is favorable.

OCCIDENTAL.—The stopes on the 400 and 450 levels continue to yield ore of a fair grade. All parts of the mine are looking well.

YELLOW JACKET.—Are making the usual shipments of ore to the mill. A good deal of exploring work is in progress and some good streaks of ore are being found.

UTAH.—The north drift on the 725 level is making good progress in vein material showing some quartz.

ALTA.—About 300 tons of ore per week is the average yield from the regular producing sections, which continue to hold out and promise well. Average assays about $24 per ton.

JUSTICE.—Favorable indications are found at most points where explorations are being made. The usual amount of ore is being milled, and the average assay holds up to $36 a ton.

CHOLLAR.—The usual amount of ore is being produced from the producing sections, giving an average assay of about $20 per ton. Exploration and development work go ahead as usual.

POTOSI.—The ore-producing sections are looking and yielding well. Twenty stamps of the Nevada mill are now being run on Potosi ore. As soon as the station (now making) at the 1130 level of the winze is completed, exploring drifts at that point will be started.

WARD COMBINATION SHAFT.—The drift running east from the 800 level station still has its face in porphyry.

IMPERIAL CON.—East crosscut No. 1 on the 1000 level is out 335 feet, 22 feet having been advanced during the week, the face showing porphyry. West crosscut, same level, is out 359 feet, 24 feet having been added, the face showing quartz and porphyry.

ALPHA.—Prospecting at the usual points on the 600 level. The formation is very favorable and occasional bunches and stringers of ore are being encountered.

SAVAGE.—Are extracting ore from the 500, 600, 750 and 1300 levels. During the week we have hoisted 679 cars of ore; shipped to the Rock Point mill 401¼ tons and to the Mexican mill 275¾ tons, and milled 676 tons; average assay, $23.16. Bullion on hand and at the mill amounting to $11,000.

HALE & NORCROSS.—During the week we hoisted 955 carloads of ore; shipped to the Nevada mill 892¼ tons and milled 860 tons; average battery assays, $11 per ton. We have bullion on hand and at the mill amounting to $6600.

CON. NEW YORK.—The exploring drifts on the 650, 800 and 1100 levels are making good progress. The 1400 south drift advanced 12 feet and is now out a total distance of 141 feet. The face is in vein matter composed of low-grade quartz and porphyry. There is no change to report of the stopes for the week. Shipped to the Vivian mill during the week 272 tons and 1650 pounds of ore, the average battery of which was $23.67.

OVERMAN.—Extracted and hoisted from the 1200 level 347 tons of ore. Shipped to the Brunswick mill 339 tons of ore. Battery assays, $18.12 per ton. Total shipment of bullion for August, $33,568.09.

Cedar District.

PROSPECTING.—Pioche *Record*, Sept. 6: This old district, situated some 15 miles south of Cliff Springs, is again receiving considerable attention. Prospecting by new parties has been going on for several months, and the outlook is said to be very good. The traveled road to the district leaves Meadow Valley Wash near the ranch of Jos. Conaway. Some samples of ore brought in during the week ranged from 280 ounces to 800 ounces in silver per ton, and general samples from a 3-foot vein averaged 68 ounces. The ledges of the district are in quartzite formation. The news created much interest in the place, and several parties have already gone there from here.

Eureka District.

BULLION SHIPMENT.—Eureka *Sentinel*, Sept. 13: Wells, Fargo & Co. yesterday shipped 12 bars of Eureka Con. bullion, valued at $28,300; also $1500 in passing bullion.

ORE SHIPMENTS.—*Sentinel*, Sept. 17: During the week the Eureka & Palisade Railroad Co. shipped 200 tons of ore to the Salt Lake City smelters. The following lots of ore were received during the week at the Eureka Con. reduction works from the mines of Eureka district: From the Phœnix mine, 19 tons; Richmond, 46 tons; Whippoorwill, 65 tons; Williamsburg, 32 tons; Dunderberg, 24¼ tons; Lord Byron, 26 tons; Hamburg, 13 tons; Prospect Mountain Tunnel, 4 tons; Mortimer, 3 tons; Lincoln, 10 tons; Woodchopper, 16½ tons; West End, 5½ tons; and Fish Creek Wells, 29 tons. From Nye county—Tyho, 24 tons; Morey, 13 tons; and Reveille, 4 tons. From White Pine, 62 tons. Silver Conner, 64 tons.

Lone Mountain District.

HOISTING WORKS.—*Independent*, Sept. 10: S. G. Weston came in yesterday from Lone Mountain. Mr. Weston is highly elated over his mining prospects in that district, and so sanguine is he of the ultimate success of his enterprise that he has ordered hoisting works, which were shipped from Denver on the 4th instant. He has secured as partners, Morton, Bliss & Co. of New York, a firm of unlimited means, and the work of developing the Lone Mountain mines will be pushed vigorously.

Tuscarora District.

NEVADA QUEEN. — *Times-Review*, Sept. 12: North drift from North Belle Isle line, 550-foot level, has been run 12 feet, exposing high-grade ore; average, $300 per ton. This drift will connect with winze from 450-foot level, which was sunk through ore all the way.

NAVAJO.—The stopes on the 250-foot level are producing a fair grade of ore. The water is now 93 feet below the 350-foot level.

DEL MONTE.—Second level—No. 2 north drift from North Commonwealth line in 27 feet; progress, 14 feet.

BELLE ISLE.—No. 1 east crosscut from the north drift, 250-foot level, extended 14 feet, cutting a considerable width of quartz giving low assays. No. 1 upraise, same level, extended 16 feet, showing more or less good ore all the way. The water is now 93 feet below the 350-foot level.

NORTH BELLE ISLE.—The stopes on the 150-foot level continue to produce their usual quantity of ore. The crosscut near the Belle Isle line, 400-foot level, extended 10 feet. South drift from the crosscut to the ore, 500-foot level, extended 7 feet, showing 3 feet of ore, some of it being very high grade. No. 2 upraise, 600-foot level, extended 10 feet. The upraise at the north end, same level, extended 7 feet; the ore is getting wider. Concentrator running as usual.

COMMONWEALTH.—Hoisted during the week 377 tons. Worked at Union mill, 174 11-20th tons. Battery pulp assay, $187 per ton. Bullion shipped, $28,042 96. Crude bullion on hand, about $12,000.

NORTH COMMONWEALTH.—Hoisted during the week 707 cars of ore. Worked at concentrator 399 tons, yielding 53,000 pounds concentrates. Ore sent to mill, average assay, $188 per ton. Did not work any ore at mill this week, as the room at the rock-breakers was filled with concentrates and wanted to get it clear. Will start milling Monday.

ARIZONA.

MOHAVE NOTES.—*Miner*, Sept. 13: Twiggs & Kelly, who have a contract on the Esmeralda, have the whim up and everything ready for work. Marshall & DeBourdage are working a gold claim near the Night Hawk, and are taking out some good ore. Durden & Gilliland, lessees on the Empire, are taking out good ore; have a carload ready for shipment. T. K. Buttolph has taken a lease on the Haas mine near Mineral Park, and will put on a force of men in a short time. Barney McCall, who has a lease on a portion of the Empire ground, is taking a lot of ore which will go 400 ounces to the ton. The working over of dumps, which before the rise in the price of silver were considered as worthless, is attracting the attention of our miners. Pete Caffrey and Jos. Labaree have a lease on the Night Hawk dump, and have a carload of ore about ready for shipment. They are making good wages sorting the dump. A. W. Eaton, Chas. Gordon and T. B. Wolfe have taken a lease and bond on the Peacock mine in Quigley Wash in Wallapai mountain. W. A. Neal is the owner. Stinson & Boland are working a claim in Todd Basin, above the Oro Plata, and are taking out ore that assays 80 ounces per ton, and are in hopes that it will improve in quality. Frank Welsh, superintendent of the O. K. Co., spent Sunday in Kingman. The machinery has all arrived, and is on the way from Hackberry to the mill, and the mill will in all probability be running by the first of October. The mine is looking fine, and hoisting works will be put up some time during the year.

BRITISH COLUMBIA.

A $9000 SALE MADE.—Nelson *Miner*, Sept. 8: This week Watson & Ernest sold the Fourth, a claim discovered by them on the 4th of July last, for $9000 cash, the purchasers being interested in the Pacific Bullion Co. of Spokane Falls. The price realized is a good one for a prospect, on which but little development work has been done. On receiving the cash, Ralph Watson left Ainsworth for a trip to his home in one of the Eastern provinces.

WORK TO BE COMMENCED ON THE NO. 1.—Work will be commenced the coming week on the No. 1, a claim in the Hot Springs district owned by the Revelstoke Mining Co. A drift will be run north from the tunnel now in nearly 400 feet, then an upraise made to the incline shaft. This will drain the present workings and enable the ground to be thoroughly prospected to a depth of about 300 feet.

GOLD DUST FROM 49 CREEK.—D. B. Huntly reports work at the hydraulic claim on 49 creek delayed on account of lack of lumber for sluice-boxes. This will be overcome, as that veteran whipsawyer John Loge has undertaken to get out the lumber required. Gold dust will be arriving at Nelson within a month from that promising camp.

COLORADO.

LATE ACQUISITION.—Aspen *Times*, Sept. 10: The Late Acquisition is still showing considerable ore. When Manager Ray was asked about it yesterday he stated that the ore had again come in and the property was looking fairly well. The ore, however, he said was very low, running only from 8 to 10 ounces of silver and about 24 per cent lead.

THE SMUGGLER.—The Smuggler has temporarily suspended shipments pending repairs on the drainage tunnel. The ore that is now being mined is taken out just over the main level with which this connects, and is sent out to the railroad through the tunnel.

CONCENTRATOR CONTRACT.—Messrs. Schuler & Stockder yesterday let the contract for the construction of their concentrator building. Mr. Fred Frye is the contractor. Work will be started up at once and the contract calls for the completion of the building within two months. By that time they will have their machinery ready to put in.

DAKOTA.

GALENA MINES.—Deadwood *Pioneer*, Sept. 12: A number of mines in the vicinity of Galena are the scene of busy operations. Shipments from this camp are being regularly made and are increasing in amount as the mines are developed. Nearly all of the ore is shipped to the Omaha smelting works for treatment, and is loaded on the trains at Sturgis, the nearest railway point to the camp. Among the companies now making shipments are the Cora, Gen. Merritt and Richmond, the latter in large quantities. Inspector of mines Corkhill returned from a visit to Galena yesterday, and from him we learn that the Richmond and Merritt are

being steadily developed and are producing some good ore. A reduction of $5 per ton on cost of hipping ore to Omaha will be made when the oad reaches the camp.

IDAHO.

BUNKER HILL & SULLIVAN.—Wardner *News*, Sept. 8: Work has commenced in good earnest for the erecting of the Bunker Hill & Sullivan concentrator. The mill-site is a fine piece of ground of 12 acres within half a mile of the Wardner station of the Union Pacific railroad. Robert Cheyne, who is superintendent of all the work connected with the erection of the mill, has a force of 45 men clearing the route for the tramway and grade for the mill. The building will be a mammoth concern 247 feet in length, 72 feet wide and 40 feet in hight, with a capacity of 400 tons per day. The tramway to be used is known as the "Bleichert Patent System." The entire length of the tramway from mine to mill will be 8820 feet, conveying buckets to and fro with a capacity of 1000 pounds each. The ore extracted will be put through Gates crushers at the mine, where bins will be located with a capacity of 1000 tons. It will then be removed by tramways to the mill, which will also contain 2 Gates crushers, 2 sets of improved Cornish rolls, 16 by 30, 10 sizing screens, 24 jig machines, 3 double-decked Evans tables, 6 Flue vanners, 2 sets of 24 by 14 rollers, 2 sets of 20 by 10 rollers and 2 trough conveyors 100 feet in length to convey the ore from the concentrator bins to the Gates crushers and rollers. The machinery will be run by water-power obtained at the mouth of Elk creek and conveyed a distance of three miles in a flume 8 feet wide by 5 feet deep. Two of the celebrated Leffel water-wheels of 72-horse power each will be brought into requisition. As soon as the grading of the mill-site is completed, work will commence on the erection of the concentrator.

LOWER CALIFORNIA.

A PROSPECTING TRIP. — *Lower Californian*, Sept. 11: W. J. Lyons came up on the steamer Pacheco Monday morning on his way to San Diego. For two months past he has been cruising along the coast below Cedros island in the schooner Ethel, with Tom Owens, stopping wherever there was a suitable landing and prospecting for minerals. Mr. Lyons went as far south as Magdalena bay and looked over the country thoroughly. When asked what he had found, Mr. Lyons said that as the trip was entirely in the interest of other parties he did not feel at liberty to give the result of his labors. However, it is safe to presume that his search was not a fruitless one, for in the large territory which he traversed he certainly must have found more than one good prospect. Mr. Lyons visited La Purissima valley, situated between the 25th and 26th degrees of latitude, about 20 miles back from the coast. There is no timber in the valley, but plenty of running water. The surplus products of the valley find a ready market at Mulege and Santa Rosalia, three days' journey distant, on the Gulf shore, where 4000 men are employed in and about the copper mines, and in the smelter owned by the French Co.

MONTANA.

THE HECLA'S SHIPMENTS.—*Montana Mining Journal*, Sept. 13: The Hecla Mining Company of Glendale is shipping three carloads of high-grade concentrates every week. The company is about to start up another furnace and will run the works to their full capacity during the coming fall and winter.

THE EUREKA AND CHAMPION SOLD.—The sale of the Eureka and Champion mines in Madison county to H. Veeder, representing a Pittsburg syndicate, is announced. A company will be organized to thoroughly develop the properties which have already been opened up to a considerable extent.

HIGH GRADE ORE.—A strike is reported in the Mineral Hill, a new claim on Indian creek, east of Champion, owned by Mishler & Pinney. Assays return from 300 to 350 ounces silver per ton. The extent of the lead is not stated. The property is situated near the Patsy-Watomie groups, recently acquired, and is being actively developed by a St. Paul company.

THE MYSTERY.—At the Mystery, near Philipsburg, the owners are running an upraise from drift No. 3 on the vein to the endeavor to get out of a break in the vein. There are some narrow seams of rich ore in sight, and as the upraise is continued they are much more encouraged, as it seems to be widening out as the break is being gone through. It will not take much more to get through this obstacle, and if the vein continues to widen, the owners will be repaid for their labor.

NEW MEXICO.

BROCKMAN & BEALL'S BONANZA.—*Southwest Sentinel*, Sept. 9: Another new ore body was revealed at the already famous Good Luck mine of Camp Loomis last week, which places that property without an equal anywhere in New Mexico both as regards the quantity and quality of its product. The ore from the new strike yields 28¼ ounces gold and 2400 ounces silver to the ton, and lies in quantity. A carload will shortly be shipped to Denver for treatment. That Brockman & Beall, the owners, have a fortune in the Good Luck is undoubted. Indeed everything John Brockman has touched lately has turned to gold.

OREGON.

CORNUCOPIA DISTRICT. — Union *Republican*, Sept. 12: Reports on the mines of Union county continue very flattering. Every camp seems to be enjoying greater prosperity than for some time past. The discovery made on the abrupt mountain south of Paddy's Paradise near the road leading from Union to Cornucopia is showing up very well. The owners, Messrs. White & Buckland, have an arastra in operation, operated by a water-wheel, and are meeting with success. At the Cornucopia camp everything is "looking up." The miners are more encouraged, development work is progressing nicely, and many outside capitalists are quietly coming in and looking over the situation, and it is quite probable that a great deal of property will go into there before many months. The rich strike made in the Red Jacket a short time ago, stirred up quite an excitement. There is something like 2000 feet of tunneling in the mine. Mr. J. C. Duffy of Cornucopia was in Union Monday, from whom the *Republican* learns that a Scotch Co. had bonded the Forest Queen group of mines for the sum of $30,000 for one year, $2000 to be paid the 1st of November. These mines are owned by Fifer of Huntington, Reed of Sparta, and Cox of Cornucopia, and were the first to be located in the camp, and are considered among the best there. It is thought to be the intention of the new company to commence active operations.

UTAH.

PARK NOTES.—Salt Lake *Tribune*, Sept. 15: Received at Park City sampler for week ending Sept 13th: 928,060 pounds of Ontario ore; 324,890 pounds of Anchor concentrates; 41,360 pounds of Alliance jig; 27 510 pounds of Mayflower jig; 39,130 pounds of Woodside ore. Total, 1,360,950. The Crescent Mining Co. shipped during the last week, 334 500 pounds of concentrates. Mr. J. M. Richardson, the Crescent leaser, shipped during the week, 33,130 pounds of first-class ore, and 11,380 pounds of jigging ore. The Anchor tunnel is looking fine, and they are seeding considerable ore to the Union concentrator. The Woodside is in the field again as an ore shipper, and expects to continue the good work for some time.

REVIEW.—Salt Lake *Tribune*, Sept. 12: The week has shown fair activity in the Stock Exchange. It has been a big week in ore shipments and fair in bullion. The receipts of the minerals in this city for the week ending the 10th instant, inclusive, were to the total value of $327,921, of which $248,420 was in ore and $79,501 was in bullion. For the previous week the receipts were valued at $304,884 26, of which $149,251 was in bullion and $155,633.26 was in ore. The product of the Ontario for the week was from ore sales, $17,916.18; bullion, 22 653.50 fine ounces, an approximate total of $40,569.68. The Daly output for the week was in ore sales, $9254.33. The Horn Silver pushes on production steadily, and the sales of ore average about $1200 a month, which goes mostly to Colorado. Bullion receipts in this city for the week were to the value of $42,626 by Wells, Fargo & Co., and $1000 gold bar by the same firm; McCornick & Co. (Hanauer), $33,550; T. R. Jones & Co., selected lead, $2325. Ore receipts in this city for the week were to the value of $157,857 by Wells, Fargo & Co.; $70,650 by McCornick & Co.; and $20,713 by T. R. Jones & Co.

WASHINGTON.

OKANOGAN.—*Outlook*, Sept. 8: Geo. Pfunder is working two shifts in the crosscut tunnel on the Second Thought mine. They are now in 120 feet and close to the ledge, which will be tapped 155 feet deep. E. D. Broughton has a force of men at work on the Okanogan Chief, a short distance below Ruby. R. H. Bliven of Ruby made several assays from the capping of the ledge this week, which run from 40 to 120 ounces in silver to the ton. One of the most promising prospects on Palmer mountain, as shown by recent developments, is the Dexter. A shaft has been sunk on the ledge about 20 feet, exposing an ore chute two feet thick of sulphuret ore in which there is a large quantity of brittle silver. Choice specimens will assay up in the thousands, and an average of the pay chute, as shown by three different assays, will go 450 ounces per ton. This promising claim is owned by Fred Bollman of Walla Walla and M. S. Dudley of Loop Loop.

THE PIERCE RIVER excitement has died out, and the prospectors who left these diggings three weeks ago, attracted thither by the display of a few specimens and a story of immense bodies of high-grade galena ore, are now returning with a weary and disgusted look on their faces. J. M. Haskell, the California expert, was one of the first to visit the new excitement and the first to return. He expresses his opinion of it in very forcible language. The country, he says, is the most inaccessible he has ever prospected in, and as a mining proposition is the biggest bilk on record.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

CALIFORNIA MINERAL-WATER SUPPLY Co., Sept. 15. Capital stock, $100,000. Directors—Chas. M. Miller, S. E. Brooks, T. M. Van Winkle, F. A. Waterhouse and H. K. Waterhouse.

TIBURON IMPROVEMENT Co., Sept. 15. Capital stock, $500,000. Directors—Isaac Moore, L. J. Lewis, S. A. Eldridge, Geo. T. Bohen and A. W. Blow.

AMERICAN FARMERS' ALLIANCE OF CALIFORNIA. Object, mutual protection of farmers. Directors—W. H. Griswold, Elias Norris, W. H. Reddell, G. T. Mason and J. D. Crawford.

CALIFORNIA FRUIT-SHIPPING-PACKAGE DEVELOPMENT Co., Sept. 15. Capital stock, $20,000. Directors—G. H. Kriechbaum, W. A. Harvey, O. A. Shaw, C. J. Sharp, M. B. Frost, C. E. Gates and A. C. Harris.

NEWPORT VINEYARD Co., Sept. 15. Object, to develop land in Tulare and Fresno counties. Capital stock, $70,000. Directors—E. J. Root, L. S. Whittenden, F. A. Blakely, J. A. Merrill and K. Leak.

COQUILLE G. M. Co., Sept. 16. Capital stock, $1,000,000. Directors—S. A. Raymond, F. Braisted, W. Adams, F. W. Bowen and C. H. Watson.

SILVER AGE G. & S. M. Co., Sept. 15. Location, Nevada. Capital stock, $10,000,000. Directors—W. M. Park, J. W. Key, E. F. West, J. J. Scoville and P. P. Schmidt.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the same it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T.	LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alki Cons M Co	California	1	1	Aug 23	Oct 3	Oct 22	B B Keeler	Flood Building
Alpha Cons M Co	Nevada	5	25	Sept 16	Oct 27	Nov 11	C E Elliott	309 Montgomery St
A ta M Co	Nevada	39	10	Sept 1	Oct 7	Oct 29	L Osborn	308 Montgomery St
Best & Belcher M Co	Nevada	47	25	Aug 21	Sept 25	Oct 17	L Osborn	309 Montgomery St
Gray Eagle M Co	California	19	6	Aug 25	Sept 29	Oct 20	J M Buttington	3 3 California St
Guascaran & California M Co, Honduras		2	10	Aug 12	Sept 29	Oct 8	E Oliver	22 Montgomery Ave
Gould & Curry S M Co	Nevada	65	30	Sept 16	Oct 21	Nov 15	A K Durbrow	309 Montgomery St
Humboldt M & M Co	Nevada	1	1	Aug 16	Sept 22	Oct 25	J C Ruddock	38 New Montgomery St
Kentuck M Co	Nevada	22	30	Aug 13	Sept 22	Oct 14	J W Pew	306 Pine St
Locomotive M Co	Arizona	8	5	Aug 13	Sept 18	Oct 6	A H Fish	309 Montgomery St
Live Oak Drift Gravel M Co	California	12	5	Sept 3	Oct 9	Oct 31	J Morizio	328 Montgomery St
Mayflower Gravel M Co	California	48	20	Aug 5	Sept 6	Sept 29	J Morazio	328 Montgomery St
Mineral King M Co	Arizona	5	50	July 31	Aug 30	Sept 22	J F Norman	419 California St
Montesito M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kenk	339 Pine St
Occidental Cons M Co	Nevada	7	28	Aug 5	Sept 11	Oct 7	A K Durbrow	309 Montgomery St
Peer M Co	Arizona	9	10	Aug 7	Sept 12	Oct 3	N T Messer	309 Montgomery St
Peerless M Co	Arizona	15	15	Aug 11	Sept 23	Oct 14	A Waterman	309 Montgomery St
Sterling M Co	California	1	6	Sept 15	Oct 27	Nov 24	D M Kenk	339 Pine St
Torres M Co	Mexico	2	5	Aug 13	Sept 18	Oct 8	A Chemhaunt	328 Montgomery St
Utah Cons M Co	Nevada	10	25	Aug 5	Sept 15	Oct 2	A H Fish	309 Montgomery St
Weldon M Co	Arizona	3	10	Sept 3	Oct 9	Oct 30	A Waterman	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Belle Isle M Co	Nevada	J W Pew	310 Pine St	Annual	Sept 25
San Joaquin Valley Coal M Co	Cal.	F Bonnaetua	423 California St	Annual	Oct 1

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Caledonia M Co	Nevada	A S Cheminant	328 Montgomery St	08	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	April 10
Derbec Blue Gravel M Co	California	T Wetzel	622 Montgomery St	10	May 20
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 11

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 9, 1890.

436,204.—SNOW PLOW—L. J. Bergendahl, Port Townsend, Wash.

436,170.—WATER-WAY AND GATE FOR RESERVOIRS—T. B. Craycroft, Panoche, Cal.

436,228.—STEAM COOKER—Jane E. Ford, Ross Station, Wash.

435,966.—SASH HOLDER—F. Frank, Suisun, Cal.

436,230. — SAFETY GAS-BURNER—Frechette & Dupuis, Carson, Nev.

435,926.—GAFF JOINT FOR VESSELS—P. E. Frostad, La Conner, Wash.

435,927.—PIPE COUPLING, ETC.—J. Ginty, San Diego, Cal.

436,180.—FENCE MACHINE—T. P. Madill, Albany, Ogn.

436,293.—WINDMILL—R. B. Sinclair, Alameda, Cal.

435,983.—ELECTRICAL TRACTION APPARATUS—Wm. Stephens, Santa Rosa, Cal.

436,027.—ORE STAMP—C. W. Tremain, Portland, Ogn.

435,986.—DIE FOR MAKING LATHING—Geo. H. Tucker, S. F.

436,278.—REFRIGERATOR—Vecchio & Mignola, S. F.

The following brief list by telegraph for Sept. 16 will appear more complete on receipt of mail advices:

California—George S. Andres, S. F., apparatus for making extracts; James T. Fish, S. F., fruit-pitting machine; Smith McGaryin, San Jose, running gear; Frank McClure, Stockton, chuck for turning lathes; Dr F Oliver, S. F., bay rickers; Henry A. Peabody, Ukiah, fence post; Charles B. Towle, Vallejo, school desk; Frank White and F. J. Murphy, Pomona, animal trap.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the pateots recently obtaioed through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SAW-BIT HOLDER.—Stepheo H. Chase, San Jose. No. 435,556. Dated Sept. 2, 1890. This is an improved device for holding removable saw-bits in the saw-plate. It coosists of a locking-plate having a circular inner eod adapted to turn in a correspondingly shaped groove in the throat of the tooth openiog, and having the outer end io the form of a circular coocentric segment adapted to fit the correspondiog curve of the saw-bit, and an elastic spur or projection from the segmental head which fits ioto a corresponding chaonel made in the saw-plate.

ELECTRICAL TRACTION APPARATUS. — Wm. Stephens, Santa Rosa, Sonoma Co. No. 435,983. Dated Sept. 9, 1890. This apparatus is especially useful for propelling plows or harvesting machioes by means of a motor and intermediate conoections whereby said motor may be kept constantly connected with a stationary source from which the electrical energy is supplied to the motor, while the motor and machinery are allowed to travel various distances from the source of supply without destroying the coonection.

STEAM COOKER.—Jane E. Ford, Ross Station, King Co., Washington. No. 436,228. Dated Sept. 9, 1890. This is one of that class of steam cookers in which the steam is generated from a body of water underlying a false bottom and passes up through suitably arranged tubes into the utensil department of the cooker. The invention consists in the novel construction of the lower portioo of the steam cooker, including its false bottom, its supply reservoir, its steam tubes and its supporting plate; also in the construction of the top of the cooker, whereby a condensing chamber is formed, and in the coostruction and arrangemeot of the ulensils in connection with the receiving compartment of the cooker.

REFRIGERATOR. — Stephaoo di Vecchio, San Jose, and Joho Migoola, S. F. No. 436,278. Dated Sept. 9, 1890. This refrigerating apparatus for meats, etc., consists of an exterior casing with the proper non-conducting filliog, au interior vertical chamber for containing ice, and a surrouoding movable framework with hooks or shelves for supporting meats or other substances, together with pipes or passages for the escape and distribution of the cold air.

SASH-HOLDER.—Ferdinand Frank, Suisun, Solano Co. No. 435,966. Dated Sept. 9, 1890. This invention, which the inventor calls a "window-lock," consists of a device whereby both the vertically-moving sashes of a window may be simultaneously locked with reference to each other at any desired point. The rattling of the sashes is also prevented.

DIE FOR MAKING LATHING.—Geo. H. Tucker, S. F. No. 435,986. Dated Sept. 9, 1890. This is a die which is especially adapted for the manufacture of lathing made of metal sheets, which sheets are folded so as to form alternate elevations and depressions, with acute angles and correspondingly inclined sides to said depressions for the purpose of forming a bond to hold the mortar in place. The invention consists of a peculiarly shaped metal die adapted to bend these sheets, of which the laths are formed, into their proper shape.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Aug. 23.		WEEK ENDING Sept. 4.		WEEK ENDING Sept. 11.		WEEK ENDING Sept. 18.	
Alpha	1 15	1 30	1 10	1 25	1 20	1 30	1 10	1 50
Alta	1 05	1 20	90	1 15	1 05	1 15	1 10	1 35
Andes	70	1 25	1 10	2 35	1 10	1 30	1 20	2 25
Belcher	3 05	3 30	3 05	3 15	3 05	3 25	3 15	3 50
Best & Belcher	3 15	3 50	3 20	3 70	3 40	3 55	3 20	3 55
Bullion	2 10	3 05	2 35	2 75	2 50	2 75	2 70	2 85
Bodie Con	1 25	1 55	1 20	1 45	1 20	1 25	1 15	1 25
Bulwer	25	30	25	....	25	....	30	....
Commonwealth	2 55	3 05	3 00	3 10	3 00	..	2 75	....
Con. Va. & Cal	4 05	5 00	4 60	4 95	4 70	4 95	4 70	4 90
Challenge	2 20	2 40	2 20	2 35	2 15	2 70	2 60	2 60
Chollar	2 70	3 45	3 10	3 35	3 10	3 40	3 15	3 40
Confidence	5 00	5 55	5 37	....	5 55	5 85	6 00	....
Con. Imperial	40	....	40	....	35	40	35	40
Caledonia	35	45	45	55	40	50	50	70
Crown Point	2 05	2 85	2 65	2 85	2 70	2 85	2 70	3 10
Crocker	15	25	20	25	20	....	25	30
Del Monte	1 20	....	1 20	....	....	....	1 10	....
Eureka Con	4 50	4 90	....	....	....	....	....	....
Exchequer	85	95	90	1 00	95	1 05	1 00	1 20
Grand Prize	25	35	30	....	....	....	35	....
Gould & Curry	2 25	2 45	2 15	2 45	2 25	2 30	2 10	2 35
Hale & Norcross	2 45	2 90	2 35	2 70	2 45	2 65	2 20	2 50
Julia	25	30	25	30	30	35	30	35
Justice	1 35	1 40	1 40	....	1 45	....	1 40	1 60
Kentuck	90	1 10	1 15	1 50	1 30	1 55	1 35	1 60
Lady Wash	30	40	45	70	60	65	60	75
Mono	60	70	50	60	55	60	50	55
Mexican	3 10	3 45	3 05	3 45	3 15	3 35	3 15	3 30
Navajo	....	....	40	45	30	40	....	....
North Belle Isle	1 10	....	1 05	1 15	1 00	....	....	....
New Queen	75	1 10	90	....	75	80	75	....
Occidental	90	95	90	1 00	1 00	1 35	1 35	2 30
Ophir	4 65	5 25	4 75	5 25	4 85	5 12	4 85	5 00
Overman	2 10	2 25	2 15	2 25	1 15	2 25	2 20	2 45
Potosi	6 12	7 37	6 00	6 60	6 25	7 25	6 75	7 00
Peerless	10	....	10	....	10	....	10	30
Peer	10	20	10	15	10	* 25	10	30
Savage	3 35	4 20	3 65	4 25	3 75	3 90	3 55	3 90
Sierra Nevada	2 65	3 15	2 80	2 90	2 75	2 85	2 75	2 95
Silver Hill	25	30	31	40	35	....	35	45
Scorpion	20	25	20	25	30	30	....	....
Union Con	2 85	3 10	2 80	3 00	2 85	2 90	2 85	3 00
Utah	65	80	75	85	75	1 05	1 00	1 25
Yellow Jacket	3 15	3 50	3 25	3 10	3 25	3 40	3 30	3 65

* Assessment de inquent.

Sales at San Francisco Stock Exchange.

THURSDAY, Sept. 18, 9:30 A.M.

50	Hale & Nor	2.35	
300	Hendricks	.49c	
1650	Alpha Con	1.20	
200	Julia	.35c	
50	Alta	1.30	
300	Kentuck	1.30@1.85	
5800	Andes	2.10@2.40	
200	Lady Wash	.70@75c	
300	Belcher	3.35	
50	Nevada Queen	.95c	
120	Best & Belcher	3.35@3.40	
100	N. Belle Isle	1.15	
200	Bodie	1.25	
50	Ophir	4.90	
500	Bulwer	.30c	
150	Overman	2.35	
400	Caledonia	.55c	
100	Peerless	.30c	
50	Challenge Con	2.60	
100	Potosi	6.87½@7.00	
200	Chollar	3.25	
270	Savage	3.60@3.65	
50	Confidence	6.75	
100	Seg. Belcher	1.60	
100	Con. Imperial	.40c	
100	Scorpion	.30c	
200	Crocker	.30	
100	Si rra Nevada	2.85	
400	Crown Point	2.95	
300	Silver Hill	40c	
350	Exchequer	1.05@1.10	
250	Utah	1.15	
50	Gould & Curry	2.15	
300	West Comstock	.55c	
200	Grand Prize	.32c	
100	Yellow Jacket	3.40	

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none out worthy meo.

H. KELLEY—Modoc and Lassen Cos.
T. M. STACKUS—Sierra Co.
T. B. LESIEUR—Humboldt Co.
J. W. PURDY—Sonora, Cal.
GEO. WILSON—Sacramento Co.
J. P. QUINETTE—San Francisco.
J. C. HOAG—San Francisco.
SAMUEL CLIFF—San Luis Obispo Co.
W. W. THAGEALDS—Orange and San Diego Cos.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
E. B. TAFT—Clements, Cal.
E. H. SCHAEFFLE—Calaveras Co.
WM. M. HILLEARY—Oregon.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.
R. G. BAILEY—Washington.
A. S. ROBERTS—The Dalles, Oregon.
J. G. H. LAMPADIUS, Monterey Co,

MECHANICAL PROGRESS

The Latest Aluminum Process.

The discovery of a new aluminum process by a gentleman in Chicago, recently, has been widely announced in the trade press. The reported discoverer, Mr. E J. M. Hirsh, in a recent letter to the *Industrial World*, thus gives further particulars:

"Complying with your request for a brief statement regarding aluminum, I beg leave to say that I can certainly make it for 15 cents a pound, having proved that fact by actual test, and most likely for one-third that amount, in spite of the opinion expressed by a New York chemist that 25 to 50 cents was the lowest price he considered possible to make the metal for. He guesses upon a basis of ignorance and I state from actual experience. But while I can produce the metal at that price, I do not propose at this stage to sell it for that figure. I have orders enough on hand for the metal at a high price to keep me busy for several years, even with a capacity many times my present one, and although I shall produce in the immediate future considerable quantities, it will not affect the present market value of the metal for a long time, as my orders for manufactured goods will realize for me the present price of the metal and still produce the manufactured articles as cheaply as if made of any of the common metals."

Mr. Hirsh gets his clay in the immediate vicinity of his works. It exists in inexhaustible quantities and is of a good quality. He says that it will be impossible for him for many years to do more than meet the demand for aluminum at his present selling price, which, however, is not given. Mr. Hirsh closes his communication as follows:

"I have also received numerous offers of financial aid, which I am compelled to thankfully decline, because I have enough for my present ability to manufacture, and if I had millions at my immediate command, as I have been offered, the element of time has to be considered, which it will require to erect works and start them.

"Were the iron business to-day in the phase of the alumina trade, although the former metal is known to be produced for nearly one cent a pound, the time required for the establishment of iron-mills, with all the varied machinery as it exists now, would require years and millions. Aluminum finds numerous uses where iron or other metals are unfit to be employed, so that the demands for it are really greater than for iron, and a reduction of its market value, even if produced cheaply, must be left to the future. The present great value of aluminum lies not in its ability to compete in price with cheap iron or tin, but in its qualities, rendering it useful and indispensable in cases where the baser and more imperfect metals cannot be employed to advantage. I shall turn out all classes of products that can be made from the metal, but shall not throw any of the crude material on the market, for the reason that my present orders for these products, from a ball to a railroad car, will require all the metal I can produce."

Railroad Car Wheels.

One of the most serious causes of accidents on railroads arises from imperfections in wheels. Notwithstanding the utmost precaution is taken in their manufacture, imperfections will creep into the best material. Perhaps the most careful observations and statistics in this department of railroad work come from Germany, where such work is undertaken by the Government.

The causes of accidents for the year 1889 are given in the last Government report as follows: 1312 fractures were due to impure, spongy or soft metal, 796 to brittle metal, 652 to the effect of heat and cold. In every 10,000 wheels of all kinds, 27 have been broken. In every 10,000 locomotive wheels, 43 broke; 51 failed of every 10,000 on tenders, 35 of every 10,000 on passenger cars, 53 of every 10,000 on mail cars, 35 of every 10,000 on baggage cars, and 25 of every 10,000 on freight cars. As regards the material of the tires, puddle steel made the worst showing, with 68 failures in every 10,000 wheels; then came iron with 47 failures, and finally the different kinds of ingot steel (cast, ornoible, Martin, manganese or Bessemer) with 27 failures per 10,000 wheels. The different lines are now fastening their tires with some of the new methods of the Mansell type, almost entirely. A great number of the failures can be directly traced to injuries sustained during fastening. Of 10,000 tires attached in the old way, 53 failed, while with a like number of wheels using the new methods of fastening only 12 failures were reported. About two per cent of the failures occurred with tires from 0.8 to 1 inch thick; only 0.01 per cent took place on tires of 2.4 inches or over.

MAGNETIC SEPARATION OF ORES.—Considerable interest is being manifested in various quarters in relation to the separation of ores by magnetic selection. Mr. Edison has been working for some time in this direction, and seems to have met with very satisfactory success. He has one or more patents for his machine. Another inventor in Philadelphia is working in the same line. This invention is now in the hands of a Chicago company which proposes to put it into practical use in the separation of the magnetic ores from sea sand. This machine consists of a cylinder, whose surface is composed of electro-magnets, revolving on the inside of an endless canvas belt. The sand is fed to the belt, and a spray of water separates the particles, the iron being retained by the powerful electro-magnets, and carried off on the belt to a receptacle at the other end, while the sand falls into the trough below. It is claimed that the machine, working on sand that contains from five to seven per cent of iron, will extract the iron sand for about one-eighth of its value in the Eastern market. Machines which will do that might find an almost unlimited sale in California for working such sands, which are found in immense quantities for hundreds of miles along our coast.

PETROLEUM USED AS FUEL SIXTY YEARS AGO. Although looked upon as recent, the use of liquid fuel is not by any means new. It is claimed that so long ago as 1830, H. Pinkus made use of hydrocarbon in conjunction with streams of vapor for steam-raising purposes, and from that time down to the present, engineers and inventors have been constantly exercising their ingenuity in the same direction. Among the efforts to introduce this system, we may mention Richardson's petroleum furnace, as well as Bridges Adams', which was for many years in Woolwich Dockyard; while in 1868 the Government allowed Wise, Field and Aydon's system of operating petroleum by the aid of an induced current, to be applied to a marine boiler on board one of their steam yachts. The same system had also at that time been applied to a Cornish boiler in London. The Admiralty also tried an invention of S. E. Crow, but nothing practical resulted; while in the same year Dorsett's petroleum furnace was put under the boiler of the steamship Retriever, 90-horse power and 500 tons burden. Some successful runs were made with the Retriever, but so far as this country was concerned, nothing further seems to have been done. One reason for this change may have been the fact that directly the demand was made for the class of liquid fuel used, and which previously had been almost a drug on the market, the prices went up to such an extent as quite put the idea of any profitable use of oil out of the question.—*London Machinery Market.*

A MULTIPOLAR MOTOR.—A low-speed multipolar motor has just been brought out, which, in addition to being specially adapted to the direct driving of large exhaust fans and blowers, and to operating hoists and travelling cranes, is likely to fill a great want in street-railway work by effecting a considerable saving of the power now wasted in the gearing. Most motors and dynamos are run at a high rate of speed, because it is impossible to secure at a low speed, with the construction hitherto in vogue, the required efficiency, regulation and output. The value of the new type of motor may be understood from the fact that its armature revolutions per minute are between 600 and 500 in the sizes ranging from 4 to 20 horse-power, which is less than half the speed of the ordinary motor, and for special work the winding is adjusted to 350 revolutions. It will readily be seen that outside of the question of efficiency, the saving in wear and tear is considerable. The excellent qualities exhibited by these machines as dynamos will insure their being largely used in small isolated incandescent-light plants. When used for this purpose they are compound wound, and the regulation is said to be so perfect that all but one lamp may be turned off without moving rheostat or brushes, and without appreciable change in the brilliancy of the remaining lamp.—*Ex.*

IRON VS STEEL FOR AXLES.—On account of numerous and repeated failures of axles on the Rajputana-Malwa Railway, the Bombay, Baroda and Central India Railway Company, who work that line, have resolved to replace the steel axles in use by others of the best iron. Sir Alexander M. Rendel, the company's consulting engineer in England, had originally recommended the use of steel for axles, because he thought that steel was not only better than iron, but also because its price was not more than half that of the class of iron suited for axles. He was further moved to do so by the opinion that, while steel was improving in quality, and daily taking the place of the best classes of iron, the quality of those classes of iron must deteriorate, as the price obtainable for them must diminish. In respect to the relative price of iron and steel, Sir Alexander Rendel was quite right; but he himself now admits that in respect to their relative suitability for axles he was wrong, or, at any rate, premature. Commercial steel, when used in axles, seems subject to deterioration, which makes it very brittle after a few years' wear.—*Indian Engineering.*

TO PREVENT VIBRATION.—Many suggestions have been made for remedying the vibration and noise attendant on the working of the big engines which are employed to run dynamos. A plan which has given great satisfaction is to build hair felt into the foundations of the engine. An electric company has just had one of its 90-horse-power engines removed from its foundations, which were then taken up to the depth of four feet. A layer of felt five inches thick was then placed on the foundations and run up two feet on all sides, and on the top of this the brickwork was built up. The cost of the alterations was about $300.—*Safety Valve.*

SCIENTIFIC PROGRESS.

Electrical Progress

It is almost impossible to keep track of the wonderful strides that are being made in the application of electricity to the industrial arts. The mere figures connected with the enumeration are bewildering. We have already $500,000,000 invested in electrical appliances; and still, with all this investment of capital, we don't know what electricity is, or how it works. We only know that it performs work. We conduct it from point to point by means of a wire. How does it travel? We know it doesn't travel through the body of the metal as sound does. We don't know that it "travels" at all. We only know that it gets there. Many theories have been propounded, but none seems to meet all the conditions. Our

Views in this Regard are Constantly Changing

Dr. Louis Duncan has recently pointed out that, though the generally accepted views about an electric current have profoundly changed in the last two years, the new ideas have not spread very widely even yet. The old idea was that electricity flowed through a wire very much as water flows through a pipe; but the new idea is that the energy does not flow through the wire at all. The energy is actually transmitted by the ether outside the wire. In running a motor the energy used in running it does not pass through or on the wires at all, but passes from the dynamo at the electric-lighting station to the motor *through the ether* surrounding the wire. The wire acts simply as the core of a disturbance in the ether, making the transfer of energy possible, but not itself transferring it.

Electricity in Commercial Chemistry.

It would seem from recent developments that electricity is largely widening its range of usefulness, and gradually invading the whole domain of commercial chemistry. A factory for the manufacture of chlorate of potash by electricity has been erected in Switzerland; soda is being obtained by electrolysis of sea salt; the electric bleaching of paper pulp is now largely carried on in France, and now it is proposed in Germany to manufacture electric soap on a very extensive scale. The transformation of wood into paper pulp by the electrolysis of a salt solution into which sawdust or wood is immersed, has been proved to be practical, and steps are being taken for the establishment of the industry. The disintegration and the bleaching of the vegetable fiber take place at the same time by the action of the soda and the chlorine formed by the passage of the current. Some sugar works in Havana have recently availed themselves of electrical applications in the manufacture of sugar. The juice of the cane is poured into the middle compartment of a series of troughs, which are divided into porous partitions. The outside compartment contains water, in which are placed blocks of carbon connected to the negative pole of the dynamo. The positive pole of the machine is connected with carbon plates in the middle compartment. The sugar juices are purified from the salts they contain, which are taken up by the water. The addition of the current assists the osmotic transfer across the porous partitions. This method is said to effect a great saving in time and to produce superior sugar. We trust we are not going to have another "electric sugar" swindle!

Magnificent Possibilities.

Great as are the wonders which have been achieved by electricity thus far, there is good reason to believe that the possibilities of the future are still more magnificent. Some of the best engineers and electricians of the day think we may yet derive electricity directly from coal or heat. If that should be accomplished, the days of steam would be numbered. Another of the possibilities which has been suggested in connection with electricity is the

Production of Light Without Heat.

The result that would follow the production of light without heat by accomplishing a similar coincident vibration of etheric and magnetic waves by means of an electric current, would only be equaled by the dazzling rewards that await such a fortunate invention. Imagine, remarks the *Electrical, Mechanical and Milling News*, a luminous wire, carried the whole length of the street, giving out a soft and beautiful radiance, like the sun at noonday, instead of the isolated and alternating spots of light and darkness which are the results of the best systems of lighting in use today. Imagine it! No lamps to trim or intricate mechanism to get out of order, nothing but the cold and inminous wire shedding its radiant beams upon the darkened earth wherever it may be led. This and the production of electricity direct from fuel without the intervention of steam engine and dynamo, would be feats worthy of the brightest genius of this or any other age. The scientists at work on these problems may be a mile or two out of the highway to success just at present, but in the light of past discoveries it would be idle to say that it will not be accomplished.

Improving the Dynamo.

Great improvements are yet in store in improving the dynamo. It is a very remarkable fact, says the *Electrical World*, that in less than a score of years the dynamo should have reached so high a state of development that, so far as efficiency is concerned, there is little left to be done. The best dynamos, to-day, actually return as electrical energy more than 90 per cent of the power used in driving them. Much beyond this we cannot hope to go, for we have no material of infinite conductivity, no insulator against magnetism and no perfect lubricator. Even now, slight increase in efficiency is often gained at too high a cost in material and labor. But the dynamo is by no means perfect yet, and it behooves inventors not to sit down and wait for the much-rumored and never-seen methods of obtaining electricity direct from heat, but to sharpen their wits and go to work. And first of all, let them turn their efforts against that root of all electrical evil, the commutator. It has no virtues to speak of, and is a most fruitful source of trouble. We already have alternating dynamos quite free from its malign influence, and it is high time we had a continuous-current machine of a similar sort. The problem is difficult, it is true, but there is no reason to think it impossible, and we commend it to the attention of the inventors who now fritter away their talents devising crude and unusual forms of field magnets. The commutator must go.

THE FIXED STARS NOT "FIXED."—Science has proven, beyond a reasonable doubt, that there are movements among the fixed stars which will eventually break up and scatter the constellations as they are now mapped on our celestial charts. These constellations have been observed and mapped during a period of only about 4000 years. Careful measurements have been made during only one or two centuries; but enough has been learned in that short period to prove that the so-called fixed stars are not "fixed." One of the most notable instances of the constant and yet almost imperceptible changes taking place in the heavens is to be found in the motion of the seven bright stars collectively known as the Big Dipper. Huggins, the noted astronomer, is now engaged in proving that five of these stars are moving in the same direction, while the other two are moving in a direction directly opposite. Prof. Flammarion had reduced Huggins' calculations to a system, arranging them upon charts. These ingeniously constructed heavenly outlines show that 100,000 years ago the "Dipper" stars were arranged in the outline of a large and irregular-shaped cross; and that 100,000 years hence they will have assumed the form of an elongated diamond, stretching over three or four times the extent of sky now occupied.

NOT NEW.—It is an interesting fact that ice was artificially produced in India long before the invention of machines for the purpose. In the upper provinces water was made to freeze by exposing it during cold nights in porous vessels and bottles wrapped in a moistened cloth. In Bengal, shallow pits were dug and filled nearly full with dry straw, on which were set flat porous pans containing the water to be congealed. Exposed over night to a cool wind, the water evaporated at the expense of its own heat, and the consequent cooling took place with sufficient rapidity to overbalance the inflow of heat through the cooled air above, or the badly conducting straw below. Ice made in this way, however, was costly, and when, in 1833, natural ice was shipped from the United States to Calcutta, it was sold for half the price of the manufactured article. On the other hand, a machine shown at the Vienna Exhibition in 1870 made 30 cwt. of ice an hour, at a cost of 25 cents a cwt., and it is now asserted that ice can be manufactured on a large scale for less than $1 a ton.—*Ex.*

GAS AND ELECTRICITY.—We have already alluded to the fact that hydrocarbon vapor has been successfully burned in small electric arcs for the purpose of increasing the light at a less expense than would be required to increase the power of the electric current. The *Electrical Review* of London says that after a series of experiments this has finally been accomplished with excellent results and at a cost of not exceeding six per cent on the price of ordinary carbons, for about 1½ times the light furnished by the ordinary lamp. It is proposed to supply hollow carbons with the hydrocarbon attachment suitable for use in the lamps of any system, which certainly embraces a larger field than could be done with a lamp of special manufacture having this improvement.

ANCIENT HISTORY VIEWS FROM A CAR WINDOW.—A railroad in Asia Minor runs from Scutari to Ismidt, and will soon be finished 20 miles farther. This road is to be extended into India and will be the grand transdivisional line between Europe and Asia. It passes near the tomb of Hannibal. Nicomedia is a way-station, and from the car windows the ruined walls of Nicea are in view, where the first Christian council settled the creed. It crosses streams on repaired bridges that were built by Justinian, and altogether has a right of way through more ancient history than any other road on earth.

LEAF SODA.—At the Pechiney Works, at Salindres, France, caustic soda is now prepared for the market in leaves or flakes. This is effected by allowing the hot supersaturated liquor to flow from a funnel between hollow rollers, which latter are kept cool down to a low point by the circulation of cold water within them.

Shop Notes.

The Uncanny Mechanic. — Certain men who are trying to be mechanics are trying in vain. Now and then I see a man who botches everything he touches. Not long ago I was in a car-shop where one of these unmechanical mechanics was employed. My attention was attracted to his peculiar manner of doing things, and I soon saw that he was a man in the wrong place. He lacked the mechanical hand and eye. When he bored a hole through a stick, the hole was found to slant. When he sawed the end of a stick he left an end surface that slanted five or six different ways. When he tried to turn a handle, the "finished" articles coming from his hands were more like a corkscrew than a handle. When he tried to drive a nail, failure followed. It really seemed that he could split a heavy sill with a shingle nail, while the deft-handed man beside him could drive a railroad spike through a delicate veneer without cracking it. The unmechanical mechanic was destroying nearly everything he handled. All he seemed to be able to do was to sweep out, and even at that work he was likely to do some mischief. When a man of this sort has stuck to mechanical work long enough to prove his inability to do that kind of work well, he either ought to have sense enough to understand that he is at the wrong work, or those over him ought to suggest to him a change of occupation.—*Ex.*

A Fire and Heat Protection.—Asbestos is now being extensively employed for protection purposes in workshops, foundries and mills to guard against the danger of burning the hands and face and generally to make work in hot metals a safer and more comfortable occupation. Asbestos mittens to guard the hands are made for firemen, assayers, refiners, etc., and armed with a pair the artisan or workers can grasp hot irons, crucibles and the like without discomfort. Masks, too, for the face are made of asbestos, which are fireproof, and the heat from the hottest fire is said not to penetrate to the skin. Air is drawn beneath the mask for breathing, so that the flame and smoke-laden atmosphere is not inhaled. Aprons and insulator coverings for the entire body are also constructed, having like protective qualities, and for firemen complete suits of asbestos fireproof cloth are made. In a smaller way and for domestic use, sad-iron holders of asbestos may be had, and with these the grasp of the iron, however hot it may be, never causes pain or burning. Plumbers are likely to welcome asbestos cloth for joint wiping, and larger holders intended for use by smelters, molders, and workers in metal generally, are among the more recent uses of this mineral.

Oil in the Factory.—A cotemporary urges upon those in charge of machinery to use good oil and to use it carefully. It says: Using good oil and using it freely may be all well enough where every drop is filtered and used over again, but it is a shame to see even poor oil soaking into the floors and floor beams. What is to be done? Set each machine into oil trays and soak up the drip with a sponge? On machines where clock oil is used they never have trouble in this respect; and when a bearing shows signs of running down it is said to be oiled too much. Where a bearing is properly proportioned it is doubtful if the drip would be any more than could be gathered on the cleaner's waste; and yet every bearing that offers a good chance for an oil can must be kept on the drenching drip continually. A superintendent of a shop in showing up the beauties of the indicator, finds that its greatest value is in being able to tell the best kinds of oil to use on his line shafts. He has at least noticed a great difference between the good and bad running of his power-transmitting machinery. A loss in friction must be generating smoke somewhere.

Mechanics Who Read.—An employer once requested his foreman to go round among the men in the shop and advise them to make up a club to take several mechanical papers. The men did so, and when the papers came and had been read, the dinner talk of the men took a new turn. The articles in the several papers were discussed, and as a consequence a new zest was given to their work. They took more interest in it. They thought and talked about it, and studied it. Those men soon became better mechanics, and it is from such persons that foremen and shop-owners and successful men are graduated. A mechanic must be a constant reader and student if he would become a man of mark in his calling.

The Velocity of Shafting has been much increased within the past 20 years. Old mills and shops, as a general thing, are not, as a rule, so strongly put together as to withstand the vibrating motion consequent upon high speed. But when they are, great economy is found in this increased rate of speed, and new mills as a general thing are constructed with special reference to high speed. Shafts carrying 36-inch pulleys are now run as high as 350 revolutions without vibrations in any way injurious to the best working of the machinery or whatever kind of work may be carried on.

Color in an Engine-Room.—Paint the pulleys and moving parts vermilion, the body a dark green, and the hangers a brown, the brick walls being whitewashed. The effect of a line of bright pulleys in motion is very pleasing. We believe in the use of bright paint in an engine-room, and vermilion and green are very lasting colors.—*Boston Journal of Commerce.*

There are 445 complete rolling-mills and steel works in the United States, and 11 in course of construction.

Good Health.

The Injurious Effects of Railway Whistles Upon the Hearing.—An eminent Glasgow aural surgeon, Dr. Thomas Barr, has communicated to the British Medical Association some valuable data concerning the injurious effects of railway whistles upon the hearing. In railway whistles the arrangement for regulating the pressure of steam passing through from the boiler to the whistle is not usually sufficiently delicate. If the boiler should be under high pressure, the whistle is very much louder and shriller than when it is under low pressure; so that when a passenger train is leaving a station for a long run, and having therefore its boiler under high pressure, the whistle is unnecessarily loud and shrill, just when those qualities are least required. Dr. Barr urges upon the attention of the association the adoption of lower pitched whistles, with proper regulators, so as to lessen the present jarring of sensitive ears and nerves. The question of whether a whistle of lower pitch than that usually employed would be as efficient as an acoustic signal is said to have been solved by the introduction on a Scotch railway of a new form of whistle, very much resembling an organ pipe. The steam is forced on the lower edge of a brass tube closed at the upper end, and the sonorous impulses are taken up by the current of air in the tube and immensely reinforced, the pitch depending upon the length of the tube as well as upon the force of the blast. The sound resembles very much a steamboat whistle, being loud and much lower in pitch, and, therefore, less painful to the ear than the ordinary railway whistle.

Heat and the Growth of the Hair.—It is generally understood that the hair and nails grow faster in hot weather than in cold, but perhaps few are aware that any temperature can impart so great a stimulus to the growth as Colonel Prjevalsky, the Russian traveler, says the Central Asian heat did during his journey in those regions during the summer of 1889. In June the ground and the air became excessively hot, so great, indeed, as to render travel in the daytime impossible. Within a fortnight after this oppressive weather began it was noticed that the hair and beards of all the party were growing with astonishing rapidity, and, strangest of all, some youthful Cossacks, whose faces were perfectly smooth, developed respectable beards within the short period of 20 days.

A Wise Precaution.—A firm of chemists in Birmingham, Eng., placed upon all poisons sold by them directions as to the antidote which should be applied in case where the poisons are taken accidentally or intentionally by human beings. An English chemical journal gives an instance where this precaution was the means of saving life. A woman poisoned herself and then informed her husband that "she had done it." A medical man was at once sent for, but in all probability the woman would have been dead before he arrived but for the fact that her husband chanced to read on the label which accompanied the poison the instructions: "Give a mixture of chalk and water, milk and magnesia or carbonate of soda and water until medical aid can be procured." The result is that the would-be suicide is alive to-day.

Consumption.—At the recent International Medical Convention held in Berlin, Dr. Koch, the best authority on bacteriology, gave a very interesting address on that subject. The new points touched upon were some observations on tuberculosis as observed in the fowl, and on the possible curative treatment of consumption of the lungs by drugs. In a series of experiments which he lately conducted, he found that certain bodies, such as volatile oils, and certain metallic salts, such as nitrate of silver and preparations of gold, even in very small doses (1 to 1,000,000 and even less), destroy the tubercle bacilli in a very short time, and thus he believes that it is not impossible that in the course of time some drug may be found which will effectively destroy the lung bacillus without injuring the body.

High Heels and Nervous Prostration.—Physicians say that cases of nervous prostration are less frequent since low heels have come into fashion. They allow the whole weight of the body to rest on the feet, remove the tension to which the muscles are subjected by high heels and keep the calf of the leg in its normal condition.

Go to Bed at Night to Sleep, not to think over the troubles of to-day nor the anticipated trials of to-morrow. One woman said: "I plan my next day's work each night after retiring." Poor, little, nervous thing; she looked it.

The Latest Adulteration.—Cinnamon is said to be adulterated with old cigar-boxes ground up into dust.

Useful Information.

A Coal-Waste Commission.

The Pennsylvania Legislature has appointed a commission to look into, as far as possible, the waste of coal at the mines, and to devise the best practicable methods for utilizing the waste already piled up in the culm heaps. The commission is just now entering upon its work. We learn from a contemporary that investigations will be made as to the underground waste of mining, also the waste of preparation, including all processes in which the commercial size has been continually reduced, the amount of culm in sight at place of preparation, and the annual product of culm.

In regard to the utilization of coal-waste the commission will examine the briquette system, and secure recorded tests under responsible supervision, patent-office records, specimen forms and chemical analyses. The records will be thoroughly searched for information relative to all the practical mechanical appliances by which the waste is utilized without mechanical preparation, such as devices for furnaces, grates, blowers, etc., and an examination will be made of the gasifying processes by which coal-waste is utilized in the manufacture of fuel gas.

The work laid out by the commission is of great importance to the coal interests of not only this State, but the entire country. The waste entailed in our present methods of mining and handling coal is such as to engage the serious attention of those interested in the material wealth of our State, and the huge piles of culm which disfigure the face of nature in the anthracite regions show how great has been that waste.

Recently, means have been taken to utilize a considerable part of the waste, and the anthracite operators are realizing that wealth is stored in the culm banks which they have heretofore regarded as an entirely useless product. The commission asks those qualified to answer that all available information will be given, and that every means of making their investigation thorough and effective will be extended by those connected with the coal interest.

The Stick of Wood in the Barrel.—A correspondent of the *Practical Mechanic* writes that he has tried the experiment which has been written about in the press of late, of inserting a stick of wood in a barrel or hogshead of water to prevent its bursting when frozen, and has found it an effective remedy. He says he had no faith in the success of the experiment, but decided to risk one barrel, so inserted a stick about 4x3 inches and let the barrel freeze up solid, and much to his surprise the barrel was uninjured, the ice bulging up around the stick, but not a stave or section of the head started. This is a valuable thing for all to remember.

Test for Lead in Block Tin.—An optico-chemical method by which the presence of lead as an alloy of block tin may be speedily ascertained without injury to the siphon or other article constructed thereof, has been discovered by a German chemist. Ten milligrams of the suspected metal is scraped off, dissolved in nitric acid, and the solution made strongly alkaline with caustic potash. If this solution turns dark-brown on the addition of sulphureted hydrogen water, it contains lead. By making it exactly as above, diluting and comparing it with an accurately titrated solution of pure lead, one per cent of the alloy can be detected with certainty after a little practice.

Mosquitoes Hate Oil.—"Wherever you find petroleum you won't find mosquitoes," said an old oil-country man. "The insects can't stand the smell of the grease, and wherever oil wells are plenty there is no call for mosquitohars. Over and over again I've seen mosquitoes cleared out in a new oil-field as soon as a well flows. Whether petroleum, applied to the hands and face, will drive off mosquitoes I don't know, but one of the few compensations of the driller is that he is seldom troubled with mosquitoes."

Tool Handles from Compressed Paper.—A firm at Dresden is now successfully manufacturing tool handles and shafts from compressed paper chemically prepared. They are very hard and firm and have the additional advantage of being non-conductors of heat. Another German firm is making pulleys of pasteboards pressed by hydraulic power, having an iron core and strong casing. They are supposed to take up less room, generate less friction, and are waterproof.

Tough Paper.—Paper tough as wood is said now to be made by mixing chloride of zinc with the pulp in the course of manufacture. It has been found that the greater the degree of concentration of the zinc solution the greater will be the toughness of the paper. It can be used for making gas-pipes, boxes, combs, for roofing, and even, it is added, for making boats.

There are 32 compositions on the market to prevent submarine growths on iron ships, and none of them do the work.

A Device of questionable value has been suggested in Australia for the prevention of a certain class of railroad accidents. Glass tubes project before the train, and if they are broken by an obstacle an electric movement is applied to the brake, bringing the train immediately to a standstill.

Steam Boiler Notes

The Steam Loop.

A New and Valuable Invention.

The steam loop is a recent American invention, and a device which has been brought into use for the purpose of returning to the boiler the water of condensation. It is an invention of great practical value and of extreme simplicity. It is so simple, indeed, that the wonder is that no one has thought of it before. It was thought out by a practical mechanic and not by an engineer, from whom such a thing would naturally be expected to emanate.

The office of the steam loop is to cause condensed water from steam pipes or from an engine to flow back into the boiler, when the latter is at a higher level than the former, and it performs this office without the aid of any moving parts.

It is a fact well known to steam-heating engineers that when steam is flowing through a pipe it carries along with it the water of condensation, generally in the shape of a thin film on the surface of the pipe, or, when a greater amount is present, in the form of short slugs or pistons, which are pushed along by the flowing steam. The working of the steam loop is dependent upon this fact, and also upon the fact that in any closed system of pipes filled with steam the lowest pressure is found at dead ends toward which, therefore, a continual flow of steam is maintained.

In practice, heretofore, the water of condensation in steam pipes has been intercepted by "traps" and returned to the boiler by pumping. By means of the steam loop, however, a simple pipe only is necessary to do this work.

We copy the description of this device from *London Iron*, which paper gives due credit for the device to the American inventor, Mr. Barnham:

"The steam loop is formed by placing a separating chamber on the steam pipe near the engine. Into this chamber the water of condensation flows, and nothing but dry steam passes into the cylinder. From the separator the water is forced by the pressure of steam behind it up a vertical tube into a horizontal one, which again becomes vertical, returning downward. The bottom of this pipe is connected with the boiler, a valve opening inward being placed at the junction of the two. The condense water gradually accumulates in the 'drop-leg,' as it is called, and as soon as the weight of the column, plus the pressure of steam on the top of it, is sufficient to overcome the boiler pressure, an inrush of hot water into the boiler takes place. Directly the pressure in the steam loop is reduced below that in the boiler, the valve closes and the condense water goes on accumulating until it once more overcomes the boiler resistance, when another charge of water is delivered into the boiler. It will thus be seen that this constitutes a perfect circulating system, and advantage is taken of this for heating and drying purposes. The steam loop is said to be largely in use in America with excellent results, effecting great fuel economy. It is being introduced in this country by Mr. John Gillespie of Leadenhall street, London. We understand that a steam loop has been fitted up and is in successful operation at Messrs. John Penn & Sons' works at Greenwich, and is also being adopted at a number of other large works."

The *Engineering News* of New York, in commenting upon this invention, says: It is plain that the steam loop is a perfect substitute for the steam trap or steam pump as a means of returning condensed water, and vastly more economical from every point of view. It is in fact so simple, efficient and inexpensive a device that it will pay to apply it to thousands of steam-heating systems, steam jackets and engines, where now the condensed water is wasted.

It is a fact which cannot be too strongly impressed upon every steam-user and every mechanical engineer working with steam, that dry steam and the immediate return of condensed water to the boiler are of great importance as regards fuel economy. The large percentage of water contained in the steam taken from an ordinary boiler is not generally realized. Steam-separators have of late become common for attaching to an engine to insure dry steam; but if, as is often the case, the condensed water from them is wasted, the heat contained in it is a total loss. It must be a very small plant, using very inexpensive fuel, in which the economy secured by the use of a separator and steam loop will not pay their entire cost in a few years or often in a few months.

In the case of heating and drying pipes, too, the use of the steam loop makes every plant practically a gravity return system, whose economy and simplicity in operation over any other system are well known.

Patents for the steam loop have been secured for the United States and foreign countries. Messrs. Westinghouse, Church, Kerr & Co. of New York control the United States patents; and since they put the invention on the market, about two months ago, over 200 of them have been put in operation.

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Business Announcements.

[NEW THIS ISSUE.]

Mining Horse-Power Hoist—F. W. Kroch & Co.
Books—Henry Carey Baird & Co., Philadelphia, Pa.
The Mechanics' Fair of 1890.

See Advertising Columns.

Passing Events.

The Mechanics' Institute Fair opened this week, and although exhibits have been somewhat delayed, it promises to be one of the most successful ever held here. The officers have arranged for as many novelties as possible.

There is no change in the situation of the local strike of iron-molders. A few of the men have returned to work, but the large body is still out. The shops, while somewhat inconvenienced, have men enough to do necessary work.

The Columbian World's Fair Association of California has been organized, and an executive committee appointed to attend to details of the organization. There is one member from each county of the State, so that it is probable California will make a very good showing.

The movement in Congress to arrange about mineral lands and railroads, and to permit the cutting of timber for mining purposes, is a good one, which will result in great benefit to the mining industry.

A PORTLAND mill company received an order recently from Hongkong for $20,000 worth of spars. The bark Coloma is now loading them. They average 100 feet long by 32 inches in diameter, and are suitable for the lower masts of big ships.

The Silver Situation.

In our last week's editorial on the workings of the new silver law, it was given the caption "Failure of the Silver Bill," that more decided attention would be drawn to the status of the market. So far as lifting prices for the metal from the low rut into which they had drifted, the bill has proven a success and has greatly benefited the mining industry; but so far as freeing it from speculative influences by bringing the price to par with gold, or keeping it from decided fluctuations, the bill is a failure. Miners, farmers, laborers, and fully three-quarters of the business men in this country are now favorably disposed to bimetallism and would hail with unmistakable pleasure the passage by Congress of a free-coinage bill—a bill placing gold and silver on the same footing.

The favorable effect of the present bill is witnessed in renewed activity in deep-mining districts. This is evidenced in the increased sale of mining machinery. Yet it is affirmed that the silver output will not show any marked increase. This opinion is grounded upon the well-established fact that in the large silver-producing district of Virginia City the ore is running more to gold, which causes many experienced miners to be outspoken in the belief that at an early day the percentage in gold will be from 75 to 90 per cent, which is quite a difference from what it formerly was, for up to a year or so ago the percentage was from 60 to 85 per cent silver. In mining districts where work in many old mines is resumed the ore is either low-grade or else the vein is narrow, so that the output will not be largely increased from this source.

The unfavorable effect of the bill is witnessed in the widely fluctuating prices of silver, which gives to speculators a firmer, better basis for speculating in that metal and all commodities and securities whose market values are hinged upon its price.

This country wants more money. With a population nearly as large as that of both England and France, yet our money circulation is far below the latter's. While France with her large moneyed wealth is free from financial panic, ours bid for them, for by a bold concerted movement of speculators a panic can be brought about at almost any time. This is clearly shown in the later panicky feeling at the East, which was only averted by the prompt action of the Treasury and the strong probability that the Tariff bill will not, if it becomes a law, go into effect previous to the beginning of 1891. Had we free coinage the price of silver would be at par and very large sums of money invested in silver would have been in circulation.

The Eastern stringency was produced by the scare that large sums of money would at an early day be required to withdraw foreign goods from bonds before the Tariff law went into effect. This expected demand for many millions of dollars coming on a large demand to move the crops of the country, particularly that of cotton, which is the largest in the history of the country, was enough to start a serious money panic when it is a well-established statistical fact that there is hardly enough money in circulation in this country to meet the current requirements of trade.

The Coming World's Fair.

Although there is still trouble about settling down upon a site for the World's Fair in Chicago, the people are assured that this local quarrel does not retard other arrangements which are going forward. However this may be, the Pacific Coast people are proceeding with preliminaries. The general convention in this city last week was quite fully attended, and after a day's discussion intrusted the subject to an Executive Committee, which has organized and begun work. The State has been divided into 13 districts outside of San Francisco. There will be eight members from San Francisco and one from each of the outside districts to form an Executive Committee of 21. This committee will have charge of the work of preparing the California exhibit for the World's Fair. It is the intention to ask an appropriation of $1,000,000 from the next Legislature of the State to enable the work to be carried on properly. There is a proposition on foot to make a combined exhibit of all the Pacific Coast States, instead of having the product of California separate. This proposition will be discussed, but the opponents of the measure are apparently largely in the majority.

His Golden Opportunity.

In another department is printed a communication from J. H. Tingman, vice-president of the Mining Stock Association, criticising the position of Virginia papers on the subject of the milling of Comstock ore. Mr. Tingman gives figures which challenge attention. If they are wrong, then the directors and superintendent of the Hale and Norcross mine owe it to themselves, if not to stockholders, to bring libel suits against the authors of the charges. If they are correct, then the sooner those who are guilty of the wrong acts are ousted from their places of trust and made to pay to stockholders all deficits or funds wrongfully appropriated, the better will it be for the mining industry on this coast, but more particularly in Nevada.

When charges against the Hale and Norcross management were first published, there were many who did not give credence to them; but under repeated charges, with the last stronger than the first, their faith is being shaken, and unless those against whom they are published take steps to prove themselves guiltless, the shaken confidence of the public will give way to a certainty of belief that the charges are founded upon fact.

With a lack of confidence in the manner in which the Comstock mines are worked, it will take much for its removal so as to bring in a desirable class of outside buyers of mining shares. There are many who expect to have this brought about by a change in the management of the mines, by action at law, or else by having the attention of the leading capitalists, who are supposed to have interests in Nevada mines, attracted to the situation, with the view of bringing about desired reforms.

There are those who look to Francis G. Newlands as being more likely than any one else to look into the workings of the particular mines he is supposed to control in the interest of the Sharon estate, and bring about needed reforms. In this opinion, they are strengthened from the well-known fact that he has identified himself with the undeveloped resources of Nevada, which promise to make, before many years, that State noted for agriculture as well as mining. The steps he has already taken to develop the latent industries of the State are a wide departure from those of other citizens of Nevada who have been made millionaires by its mines.

Mr. Newlands has already given evidence of a desire to right any wrongs to which outside stockholders in the mines controlled by the Sharon estate have been subjected. This is witnessed in his action regarding the mill contracts of the Yellow Jacket mine. He not only had the contracts stopped as soon as he discovered that they caused the mining shares to be assessed while the company was milling ore taken from the mine, but we are credibly informed he canceled the company's indebtedness—about $200,000—when he ascertained that the said indebtedness was incurred for milling and mining rock that would not pay. For this generous act he deserves the cordial thanks of all outside shareholders. Not only was the milling contract stopped, but he reduced milling charges to $6 a ton—another act in behalf of stockholders. His good work should not end here. Now that he has his irrigation schemes and other beneficial acts well under way and no silver legislation to engage his time, he should give attention to the mine assays, car-sample assays, as well as battery assays of each and all the mines under his control. This is what the law requires (Mr. Newlands, being a lawyer, knows this to be true) and which given will disarm criticism. Not only should he see that the above is done, but more than this, he should open out the body of ore lately found in Confidence 40 feet north of the Yellow Jacket line on the 800-foot level, of which he must surely be informed by this time.

Mr. Newlands is a new mining magnate on the Comstock. He is in no way responsible for the past acts of other people, and should he judged by the stockholding community only for his own acts. Now is his golden opportunity to right the wrongs of the stockholders and at the same time do justice to himself.

We are informed that a majority of the Mining Stock Association are stockholders in the Gold Hill mines, some owning several thousand shares, and are in reasonable hopes of the much-needed reform being inaugurated there. Mr. Newlands is certainly in position to carry out these ideas, and it is to be hoped that he will see the necessity of continuing the reform started by himself in the Yellow Jacket mine and let the adjustment of affairs extend to all the mines under his control.

Corn Palaces.

The Corn-Palace idea originated in Sioux City, Ia., and at that place all the palaces have been erected. A Corn Palace is covered and embellished, as with tapestry, outside and inside, with products of the field, corn predominating, ingeniously and fancifully arranged. In building the palace a large structure is first erected of lumber, of a shape that will carry and show to advantage the multiform decorations with which it is to be adorned. It is in form lofty, with broken lines, pinnacles, buttresses, bridges, gable, ornamental window, etc. Over every inch of this wooden surface are laid corn and kindred plants in architectural harmony, in a multiplicity of designs. The corn is employed in the stalk, the ear, the kernel, and even the husk has its decorative uses. All the grains and grasses of the field lend themselves to the beautifying of the palace. The walls are covered on the outside with ears of corn, cut lengthwise or crosswise, and nailed on in geometrical figures or other designs. The various colors of the cereal permit of a wide range of shading and coloring, while its artistic possibilities, developed from year to year in building the palace, admit of the production of effects that are as startling as pleasurable.

The Corn Palace of 1890 is to be 264 feet square, or more than twice as large as last year's Palace, which was 120x240. The central building will run up to the imposing hight of 172 feet, the upper 100 feet being a dome. This main building will be in the form of an octagon 166 feet across. In the center will be an open space 78 feet across, without a post or anything to interfere with a view of the whole interior decorations. This space will run up 66 feet with an artistically painted sky at the top, studded with stars of incandescent electric light. The gallery in the Palace will be clear around the interior of the rotunda, 44 feet high, and will be 25 feet wide. This gallery will give every one an opportunity to see all there is to be seen, and it will be adorned with various exhibits as well as overlooking all the rest of the palace.

East of the main building, opening into it by two gates, will be an auditorium to seat 1000 to 1300 people. The band-stand will be between this and the rotunda, so that the music may be heard by every one in the Palace.

At the north of the main building will be another lower structure running back 100 feet. This building will run around back of the main building to connect with the auditorium, and will be 100 feet deep clear around, roofed and concealed by a battlement. There will be grottoes, beautiful and original ideas worked out in corn and showing the wealth of the great agricultural Northwest as well as the ingenuity and artistic taste of her people. One of the wonders in preparation is a miniature Niagara Falls, located so that it will be the first thing to greet the eye of the spectator as he enters the building. Here he will look down to the farthest part of the great structure, 272 feet from the main entrance, with an uninterrupted view 48 feet wide and 44 feet high. The space of one side of the octagon, 48 feet, which is the entrance to the back part of the palace, will be crossed at the gallery floor by a rustic bridge, from which all parts of the palace may be seen.

The decorations this year, both interior and exterior, will be projected on a scale grander and more elaborate than ever before. The exhibition will open September 25th and continue until October 11th.

Academy of Sciences.

At the meeting of the California Academy of Sciences on Monday evening last, a donation was received of a specimen of wood, compressed from its former diameter of 14x14 inches to about three inches by the force of rocks in the Consolidated Virginia mine.

A paper by Mrs. Theodore H. Hittell was read by her husband. The paper called for the better preservation of the hieroglyphics on the rocks for the purpose of ethnological study. A number of examples were given of the pictures on the rocks.

Dr. Gustav Eisen, in speaking on the subject after the paper was read, said that there were several thousand such inscriptions in San Luis Obispo county in a cave, and others in Santa Barbara and Tulare counties. He moved that a committee be appointed for the purpose of preserving the remains of Inscriptions. The motion passed, and Messrs. Eisen, Hittell and Rixford were appointed.

Charles Keeler read a paper on the distribution of the English sparrow and its menace to the crops.

Horticultural Art iu California.

It is perfeotly natural for persons living at a dlstance from the Pacific Coast to imagins that the finer horticnltnral art is hnt orndeiy represented here. While this to an extent is trne, as is the oase in all new and doveloping oonntries, it is nevertheless a fact that we have many examples of landscape and arohiteotural effects that for originality and beanty of conception will rival those of any oonntry.

Of the many princely places around the San Francisco bay, none are more worthy of mention than the gronnds of Capt. J. C. Ainsworth, at Claremont, Alameda county, a few sketches from which have been combined in the engraving on onr first page. The snmmer-house in the foreground is unique and original and makes a delightful evening resort. The onter surface of the shell is of beaten copper plates; the interior was shaped with patent sheathing laths, which are covered with cement, finished in gold-bronze and sea-green; the floor is of polished black cement blocks. Capt. Ainsworth's conservatories, only one of which is figured, compare favorably in design and collection of plants with any in the oonntry. The fountain challenges the admiration of the most critical artist. The effect of the covered driveway approach, with its arrangement of vines and trees, is worthy of note.

Of the terraced rockery and caverns, it is impossible to give a comprehensive idea. The arrangement is a series of fern-lined caverns, with an interior fountain, the walls composed of many-colored stones, the exterior with evergreen foliage plants, brilliant mesembryanthemums, etc. Another pretty effect is found in a secluded nook of the captain's spacious grounds; surrounded by a group of weeping trees is an immense mass of *Agapanthus Umbellatum*, in which is imbedded a large stone-rimmed water basin. The effect when the Agapanthus is in bloom is something wonderfully beautiful. Mr. John McCullum, who has the grounds in charge, has in contemplation many attractions.

The fine residence of Captain Ainsworth, valued at some $80,000, was burned on Wednesday, with its fine pictures, statuary, bric-a-brac and elegant furniture; very little of the contents being saved. The conservatories, however, did not take fire, though the stables were burned.

Of other California horticultural masterpieces, it may be remarked that the conservatories, terraces, etc., at Golden Gate Park are in many respects unequaled in the United States. Many illustrations could be given of modern horticultural structures, both commercial and private, and of growing places, designed and planted by our California gardeners, of which our Eastern friends may with some excuse feel envious.

It is not conceit to anticipate for California a most remarkable development in ornamental horticulture. With an unparalleled soil and climate, an immense number of adaptable plants with which to work, and an enterprising people imbued with the spirit of ornamentation, there is no reason why our gardens should not be the envy of the world.

SCENES ON THE GROUNDS OF CAPT. J. C. AINSWORTH, CLAREMONT, ALAMEDA COUNTY, CAL.

The Late John Cribbins.

A well-known and very skillful miner was John Cribbins, who died at the Deadwood hospital near Oroville, Butte county, on Saturday. He has done much important mining work on this coast, especially in large tunnel operations. His first work was on the Hoosac tunnel as a day laborer, where he remained until its completion, when he came to California. He soon after went over to Nevada and began work on the Sutro tunnel, where he remained four years and was then offered the position of foreman of the Guadaloupe quicksilver mines. From there he went to the Sheep Ranch mine in Calaveras county. He was subsequently foreman of the Blue Tent and other mines near Forest Hill. The Richman Rock Drill Company afterward employed him to set up their machinery in different sections of the country. After finishing the big tunnel on the Oregon railroad he came here again as foreman on the Big Bend tunnel, Butte county, where he did excellent work.

About three years ago he was called to South America to work at El Callao mine. He was finally obliged to give up the place on account of the inroads made on his health by the climate. He never recovered from the effects of the trip. His physicians here told him he must leave the city if he hoped to prolong his days. As he had always enjoyed good health near the Big Bend tunnel, he went to that vicinity. He found positions with the Golden Gate mine and the Folsom dam.

In spite of his best endeavors his health failed rapidly, and at last he was obliged to go to the Deadwood hospital for treatment. Deceased was 45 years old and leaves a widow and four children—two girls and two boys.

Le Roy, Arizona.—The growing and important camp of Le Roy adjoins the Vekol mine and townsite. The townsite of Le Roy was laid out over two years ago, and a correspondent informs us that the product of the camp has been $2,000,000. He says that the camp is, outside of Silver King, the "banner" one of the Territory, which the record of shipments proves. It is growing rapidly in importance and is a good field for investment and capital.

Solomon Heydenfeldt, a lawyer who has made mining practice a specialty for many years in this State, died in this city on Monday. He was Judge of the Supreme Court from 1851 to 1857. Judge Heydenfeldt has been legal adviser for many mining companies for years, and has conducted a great number of important mining suits.

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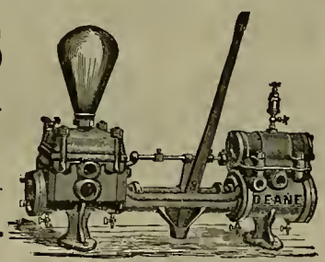

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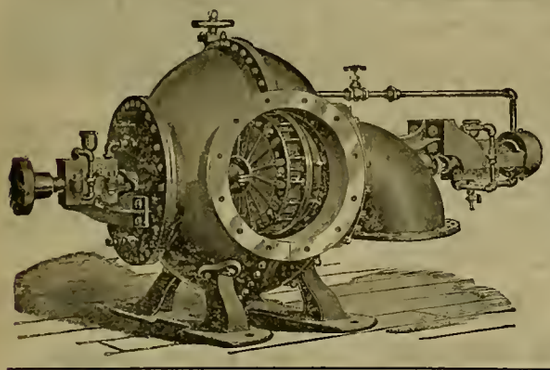

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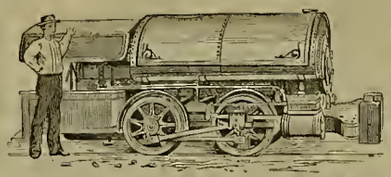

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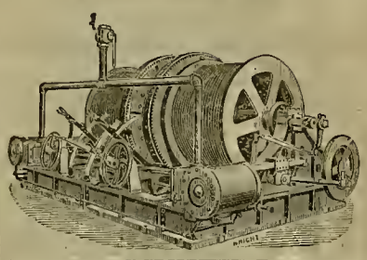

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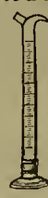

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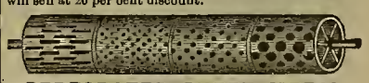

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Extra sizes and lengths made to order on short notice.

611 & 613 Front St., San Francisco, Cal.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 18, 1890.

The past week bas exbibited continued activity in general trade. The demand is for full assortments, chiefly for winter stocks.

The money market is easy under liberal remittances and general confidence is felt in the future. The call for crop purposes begins to slack off.

MEXICAN DOLLARS—The market has held steady at from 91@92 cts., with a stronger tone at tbe close. The general belief in higher prices for silver causes the strong tone for Mexicans.

SILVER—The market bas held to firmer figures, with a slight advance toward the close. The unsettled money market at the East was taken advantage of by speculators, and under a scare the price of silver was sent down far below its value when is taken into consideration the large quantity that the Treasury has to purcbase, with no material increase in the output of the mines. The Mint's counter rate in this city has ruled at $1.15¾, but at the close a bigher figure is expected to obtain. The Department at Washington bought as follows: On Sept. 12th, 321,000 ounces at $1.156@1.157½. The offerings aggregated 431,000 ounces. On Sept. 17th the offerings were 519 000 ounces, and purchases 326,000 ounces at from $1.16¾@1.16¾.

QUICKSILVER—Receipts tbe past week aggregated 446 flasks, and exports by sea 14 flasks to Panama. Tbe market is reported easy. The coast demand is said to be fairly good.

ANTIMONY—The market is weaker. Buyers are more disposed to obtain concessions before anticipating their wants.

LIME—Receipts the past week aggregate 6613 bbls., and exports by sea 300 bbls. to Hono'ulu. A slightly better demand is reported. The Hawaiian demand will soon set in more actively.

BORAX—Receipts tbe past week aggregate 715 centals. The overland shipments in last month aggregate 3325 ctls. The market is barely steady, notwithstanding the free shipments to the East.

LEAD—Tbe market is quoted at another advance, with a strong tone at the close. Witb another advance in the European markets, American markets are below the English parity. The demand is said to be slow, yet the market goes up under strong boldings.

TIN—The market for pig has gained another point, under stronger markets abroad. Tin plate is firm, but quotations are unchanged. It is reported that more is doing in future delivery. Cablegrams to the *Iron Age* report as follows:

Block tin prices bave steadily advanced and reached £98 15s. under the influence of large demand for prompt and near delivery. Recent arrivals have fallen behind the consumptive requirements, and the decrease last month of 600 tons in the visible supply has been further enlarged.

COPPER—The market has held to strong prices, but with no advance established. It looks as if American copper-mining companies will not attempt to squeeze up prices, being content to let well enough alone. The European markets are firmly maintained. New York mail advices to September 12th report as follows: Several small outside lots of Lake Superior ingot, probably 100,000 lbs., all told, have been picked up the past week at 16¾@16¾c. These purchases, it is believed, have absorbed about all the weak outside holdings. The mining companies are firm at 17c for either prompt or near future deliveries. Arizona ingot remains at 15¾@15½c, and common casting brands are quoted at 14½@14¾c, with the market showing rather better tone.

IRON—The market is steady at quotations. The quantity going into consumption is larger than at this time in 1889. The East reports a firm market, while English advices report an easier tone.

COAL—Imports the past week aggregate as follows: Comox, 2350 tons; Seattle, 5241; Coos Bay, 1150; Departure Bay, 700; Nanaimo, 3695; Tacoma, 1000; total, 14,136 tons. The market is very strong for steam in all positions. The absence of supplies from the Wellington mines and only moderate imports expected from Australia are the strong factors in favor of sellers. Puget Sound collieries are increasing their output. Large dealers are looking for higher prices when the cold weather sets in. The tonnage on the way from and loading at Australian ports is as follows: Newcastle, N. S. W., 52,571, register, and Sydney, 6681 tons' register; total, 59,272 tons' register.

Mining Share Market.

The mining share market bas been dull in the leading Comstocks, but fairly active in the smaller stocks witb Andes quite active—jumping around like a fish out of water. While the leading Comstocks were dull, there was a strong tone with unmistakable evidences of an up market. The slight but steady advances witb setbacks in the higher-priced stocks, while the "cats" move more quickly, are accepted as favorable signs. Money will soon be very easy and besides there will before long be many hundred laborers in the city, returned with money from their summer work. They will have money and will, of course, try to beat inside manipulators by speculatiug in stocks. Their buying ought to cause better prices, if nothing else will.

In outside mining sbares, trading has been more lively in the Quijotoas and Tuscaroras. Tbe Bodies have dragged, owing to a pending assessment on Mono and reports that Bodie must come lower before going up.

From the Comstock mines there are confirmed reports of rich ore to the west in Con. Virginia on the 800-foot level. Tbis probably accounts for the activity in Andes. In Savage, connection on the 1300-foot level bas been made witb Hale and Norcross. This gives good ventilation and admits of more active prospecting work on tbat and lower levels, besides which the company can hoist tbeir own ore from the lower levels. The battery assays ought to be higher. In Hale and Norcross, active work is going on—report says that they are filling up the drifts leading to the rich ore. In Ophir, active and important work will soon be inaugurated. Good results ought to he forthcoming at an early day from the work going on in Best and Belcher. The north drift running from Potosi winze toward Chollar should begin to attract attention, for it is quite certain tbat good ore will be struck. The official letter from Crown Point, received yesterday, holds out bopes for an improvement in the mine as work goes west. In Belcher the one-foot streak of rich ore has widened to very nearly two feet. Other work in the mine is of an important character, as is that in Seg. Belcher. In the Alta group the work is becoming more interesting. Another new and rich streak was run into this week in Lady Washington drift running toward Benton. Old miners are hopeful of good results in these mines at an early day.

Advices from the Tuscarora mines are very encouraging. It is claimed tbat dividends will be in order, provided the new milling company does not make milling a losing game for the mines. From the Bodies our advices report that the Standard has plenty of paying ore to run the mill for a long time. In Mono there is one miner at work. As the work progresses toward the 800-foot level in Bodie, experienced miners speak more encouragingly.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, September 18, 1890.

ANTIMONY		— @	21½
BORAX—Refined, in carload lots		6 @	—
Powdered " " "		8 @	—
Concentrated " " "		4½ @	—
All grades jobbing at an advance.			
COPPER—			
Bolt		23 @	25
Sheathing		23 @	25
Ingot, jobbing		2 @	—
do, wholesale		18 @	63
Fire Box Sheets		23 @	25
LEAD—Pig		4½ @	—
Bar		5 @	—
Sheet		4½ @	—
Pipe		6½ @	—
Shot, discount 10% on 500 bags	Drop, ₩ bag.	1 75 @	—
Buck, ₩ bag		1 95 @	—
Oblled, do		2 15 @	—
QUICKSILVER—By the flask		56 00 @	57 00
Flasks, new		— @	—
Flasks, old		4 @	55
TINPLATE—B. V., steel grade, 14x20, to arrive		— @	—
B. V., steel grade, 14x20, spot		4 80 @	—
Charcoal, 14x20		6 75 @	7 00
do roofing, 14x20		6 00 @	—
do, do, 20x28		12 00 @	—
Pig tin, spot, ₩ lb		13 @	—
CHROME IRON ORE, ₩ ton		10 00 @	—
IRON—Bar, base		3 @	3½
Norway, base		4½@	5½
STEEL—English, ₩ lb		16 @	20
Canton tool		9 @	9
Black Diamond tool		9 @	9
Pick and Hammer		8 @	10
Machinery		4 @	5
Toe Calk		4½@	—

IRON—	Spot.	To Load.
Glengarnock ton	34 00 @—	30 @ —
Eglinton, ton	34 00 @—	30 @ —
American Soft, No. 1, ton	— @32 00	33 @ —
Oregon Pig, ton	— @33 00	— @ —
Puget Sound	34 00 @—	— @ —
Bar Iron (base price) ₩ lb	— @	— @ —
Clay Lane White	— @28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Langloan	34 00 @—	30 @ —
Thorncliffe	34 00 @—	30 @ —
Gartsberrie	34 00 @—	30 @ —
Barrow	34 00 @—	30 @ —
Thomas	33 00 @—	@ —
Cargofleet	30 00 @—	26 @ —

Eastern Metal Markets.

By Telegraph

NEW YORK, September 17.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	.53⅝	1 16⅜	$16 90	$4 95	$22 10
Friday	.53	1 14	16 90	4 95	22 50
Saturday	.53	1 15	17 00	4 95	22 60
Monday	.53⅜	1 15	16 90	4 95	22 70
Tuesday	.53½	1 15½	16 90	5 00	22 80
Wednesday	.53½	1 16	16 90	5 00	23 15

NEW YORK, September 16.—Copper more animated; Calumet and Hecla filling fair orders; half-million Lake, placed closing, 17c; Arizona, 15½@15⅝c casting. Pig Lead strong; fair recent business closing, $4.90@4.95. Tin is very strong at higher prices.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let bim not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

ONE day last week A. J. Glidden of Butte county cut down a sugar pine tree that scaled 28,000 feet. The Oroville *Register* says this was the largest sugar pine on record.

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Assessment Notices.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

Notice is hereby given, tbat at a meeting of the Board of Directors, held on the 25th day of August, 1890, an assessment, No. 19, of six (6) cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 11, No. 303 California street, San Francisco, California.

Any stock upon which tbis assessment shall remain unpaid on the 29th day of September, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 20th day of October, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California Street, San Francisco, California.

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INDUSTRIAL EXPOSITION
— OF THE —
MECHANICS' INSTITUTE, 1890,
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With a grand display of Inventions, Manufactures and Art. The Latest Novelties and Improvements in Electricity will be made a special feature, including the celebrated Edison "Tower of Light." The Music will consist of a band of 42 talented musicians, supplemented by the best Vocal Talent obtainable. Miss Mathilde Lennon, a noted Contralto Singer from London, and late from Boston, has been engaged, as also Miss Pearl Noble, the accomplished young Californian Cornetist. The Art Gallery, 200 feet long and 50 feet wide, will be filled with rare and beautiful works by local and foreign artists, in oil and water colors. Photography will be shown in the most attractive form by Professionals and Amateurs. Machinery of all kinds will be in operation, and many novelties exhibited for the first time.

Admission:

Double Season Tickets, $5.00 | Single Adult Admission, 50c
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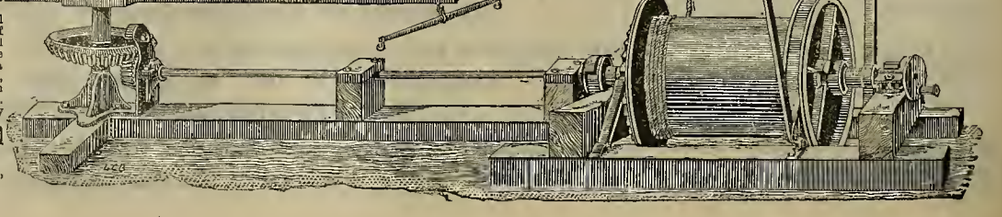

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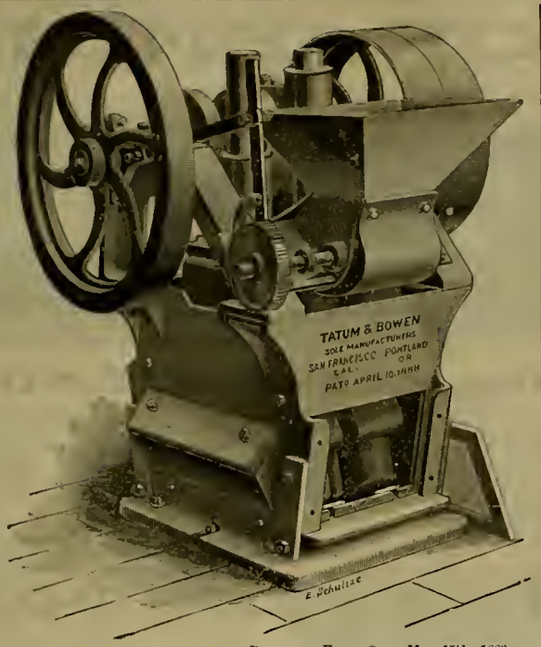

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Supt. New York Mine, Railroad Flat.

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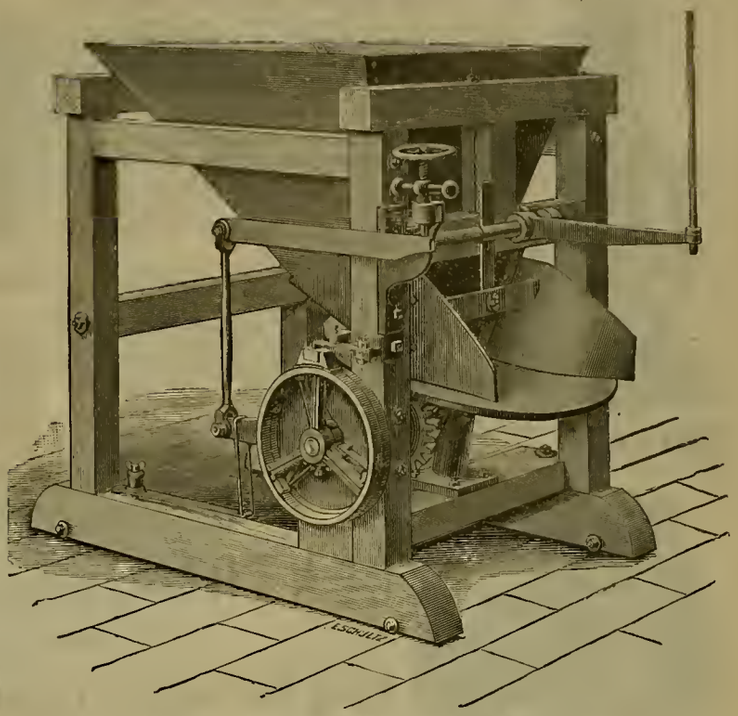

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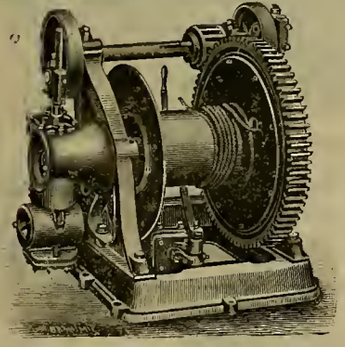

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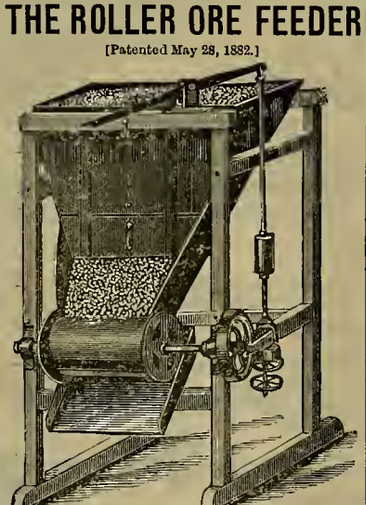

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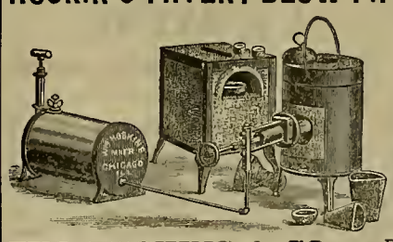

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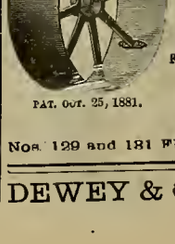


PAT. OCT. 25, 1881.

PERFECT PULLEYS

First Premium Awarded at Mechanics' Fair, 1884.

CLOT & MEESE,

Sole Licensed Manufacturers of the

MEDART PATENT WROUGHT RIM PULLEY

For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

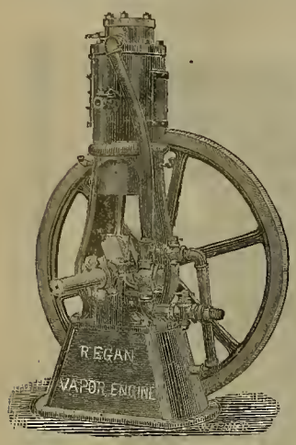
SHAFTING, HANGERS AND APPURTENANCES.

SEND FOR CIRCULARS AND PRICE LIST.

Nos. 129 and 131 FREMONT STREET SAN FRANCISCO, CAL.

DEWEY & CO. { 220 MARKET ST., S. F. Elevetor, 12 Front. } PATENT AGENTS.

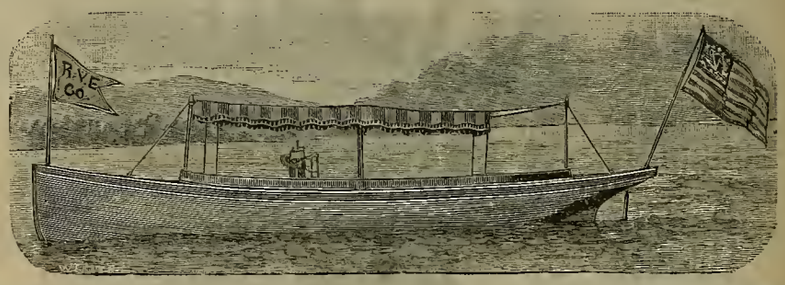
REGAN VAPOR ENGINE.



NO BOILER! NO FIRE! NO STEAM!
Simple, Compact and Cheap.
No Fire or Flame. Started Instantly without Even a Match.
No Ashes! No Explosion! No Engineer!
FULL POWER OBTAINED IMMEDIATELY.
The Moment Engine Ceases to Run, all Expense Stops.
NO DANGER.
Horizontal, Upright and Marine Vapor Engines and Launches.
Three-fourths to Fifteen Horsepower.
From $175 to $1200.
Send for Our Large Illustrated Catalogue.

GEORGE HAAS, 824 Market St., Phelan Building, } SAN FRANCISCO, Feb. 21, 1890.

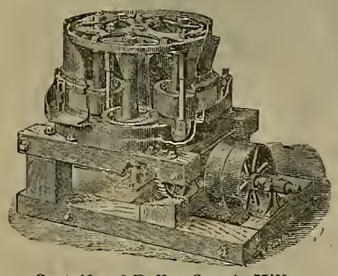
REGAN VAPOR ENGINE CO.—Gentlemen: The 2 H. P. Engine you put up in our factory last November, has given satisfaction beyond my expectations. It do s my work better than than those two Electric Motors did, with scarcely any expense for gas. I paid the Motor Company $25 per month for power, while the Vapor Engine has cost me but $2 per m nth so far. But, be it understood, I have not used the Engine as much as in summer, but the cost of motor would have been all the same, making a saving of $69 in three months. I am sa isfied the Engine will pay for itself in less than two years. I use it for freezing cream, run three fans, cocoanut grater, etc.
Yours truly, GEO. HAAS.



Regan Vapor Launches

The uses for small steamboats and launches are innumerable; they are convenient and serviceable for transportation and are a source of pleasure for those who are fond of sailing. But many have been deterred from purchasing such boats, because of the trouble and inconvenience of using coal, and the necessity of obtaining a Government license, engineer, etc. Our motor does away with these objections. The small space taken up by our engine in the boat **gives more room**; the boat will seat **twice** as many persons as one the same size fitted up with a steam engine. It takes only **two minutes to get under headway**, and can be stopped when running at full speed within the length of the boat, the reverse motion being instantaneous and effective. We carry in stock six regular sizes of hulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos. Kane & Co., Racine, Wis.

REGAN VAPOR ENGINE CO., 221-223 First St., San Francisco, Cal.



Centrifugal Roller Quartz Mill.

F. A. HUNTINGTON.

MANUFACTURER OF

CENTRIFUGAL ROLLER QUARTZ MILLS,

Concentrators and Ore Crushers,

Mining Machinery of Every Description. Steam Engines and Shingle Machines.

SEND FOR CIRCULAR.

213 FIRST STREET, SAN FRANCISCO, CAL.

THE "VULCAN"
ICE & REFRIGERATING MACHINERY

—FOR—

BREWERIES,
PACKING HOUSES,
HOTELS,
COLD STORAGE,
FRUIT STORAGE,
CREAMERIES.

ENTERPRISE BREWERY, San Francisco.

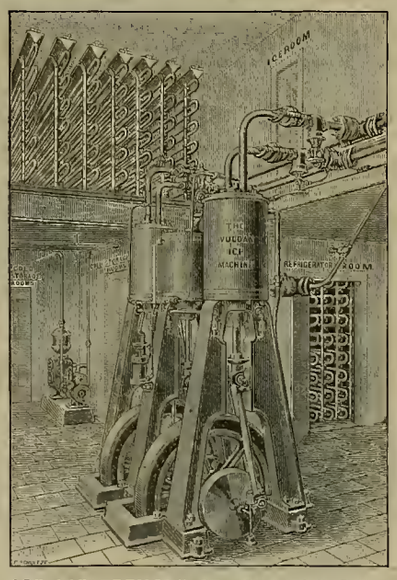
The **25-ton Refrigerating Machine** has been running continuously since 1887 and has proved economical and satisfactory in every respect.

HOTEL RAFAEL, San Rafael.

The "Vulcan" Ice and Refrigerating Plant is satisfactory in every respect, * * * * a model of good workmanship. The ice is clear.

CHAPMAN AMMONIA VALVES.
ANHYDROUS AMMONIA

VULCAN IRON WORKS, 135-145 FREMONT ST., SAN FRANCISCO.



Rock Drilling and Air Compressing Machinery

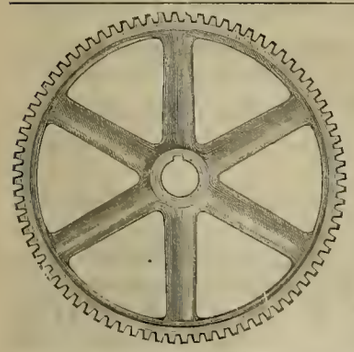
For TUNNELS, QUARRIES, MINES, RAILROADS

And Wherever Ore and Rock are to be Drilled and Blasted.

SEND FOR NEW CATALOGUE OF 1889.

RAND DRILL CO.,

23 Park Place, New York, U. S. A.



A. J. VAN DRAKE,

Machinist and Mechanical Engineer,

203 Fremont St., San Francisco.

SPUR AND BEVEL GEARS CUT TO ORDER.

Patent Models

And Experimental Machinery of All Kinds

Shafting, Pulleys and Boxes,
Engines and Boilers.

DRAWINGS, PLANS and SPECIFICATIONS made for new machinery.
Jobbing of every description promptly attended to. FINE WORKMANSHIP GUARANTEED.

FRISBEE-LUCOP MILL CO.,

—MANUFACTURERS OF—

Centrifugal Roller Steel Mills,

FOR PULVERIZING ORES, WET OR DRY,

For Amalgamation or Concentration, and for Manufacture of Cement, Fertilizers, Paint and all other purposes for which grinding or pulverizing is required.

Send for Catalogue and Price List to

FRISBEE-LUCOP MILL CO.,
145 BROADWAY, NEW YORK.

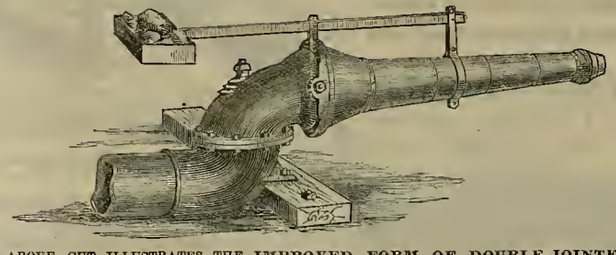
Day's Improved Quartz Stamp Mill.

This Mill is designed for the Prospector, the Assayer and Sampler of Gold and Silver-bearing rock. It is a perfect mill, built entirely of metals, and of the best mechanical construction; will amalgamate perfectly in the battery or on plates. It strikes a sharp, heavy blow with a light stamp. Shipping weight, 225 lbs. Price $75. Address

JAMES DAY,
ATLAS IRON WORKS, Cor. Napa and Louisiana Streets, Potrero, SAN FRANCISCO, CAL.

N. B.—CHAPPARELL, Butte Co., Cal., Nov. 10, 1889.—Mr. Jas. Day, Chico: The little mill is a daisy; it comes up to all expectations; it works perfect in all respects. Yours truly,
WALKER, REESE & Co.

IMPROVED FORM OF HYDRAULIC GIANTS.



THE ABOVE CUT ILLUSTRATES THE IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture. We guarantee purchasers of this form of Giants against all costs, expenses or damages which may arise from any adverse suits or actions at law. We are further prepared to furnish **Single-Jointed Giants** when required. Prices, discounts and Catalogues of our specialties of **Hydraulic Mining Machinery** sent on application.

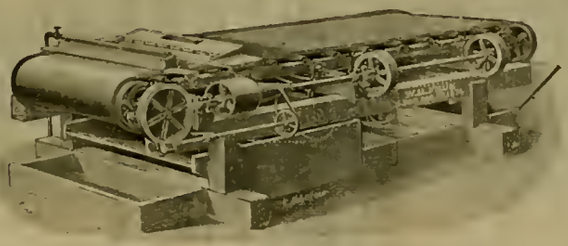
JOSHUA HENDY MACHINE WORKS, 39 to 51 Fremont St., San Francisco.

IMPROVED BELT FRUE ORE CONCENTRATOR.

The Best Ore Concentrator in the market, having do hle the Capacity and doing its work as olose as the plain Belt machine, while Its concentrations aro clean. It is used in a number of Mills, the most notable of which is the Alaska M. & M. Co's Mill, where 24 Improvod Belt Frues are taking the Pulp from 120 Stamps, orushing 350 tons per day, and is giving ontire satisfaotion as against 48 plain Belt Machines, taking tho Pulp from the other 120 Stamps.

Price ol Improved Belt Frue Vanner, $825, f. o. b.
Price ol Plain Belt Frue Vanner, $575, f. o. b.

For Pamphlots, Testimonials and furthor information apply at ollico.



Protected by Patents December 22, 1874; September 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.

DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

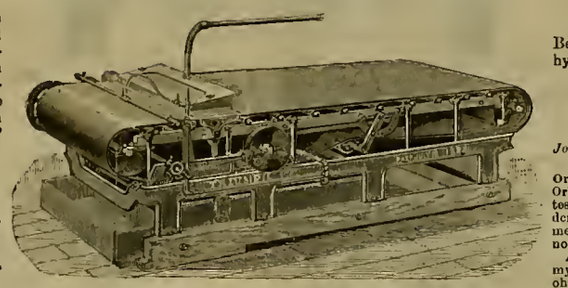
"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

Tho oompetitive trials which have heon held between the "Trimph" Ore Concentrators, the "Frue" Vanners and othor forms of oonoentrating devices, do not warrant the assertion that tho "Frue" Vanner is the best ore ooncentrator in tho market. The faot that the "Froes" have improved (corrngated) belts does not militate against the superiority of tho "Trimphs;" for, when desired, they (the "Trimphs") can he mounted with a superior helt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be.

Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Trimph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestahle letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

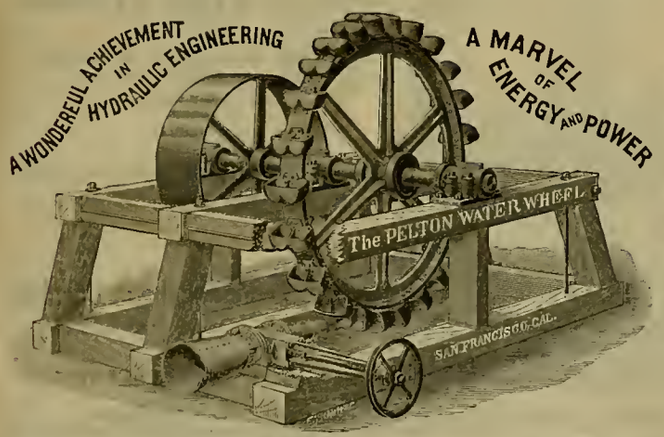
GENTLEMEN—I am pleased to state, in reference to the "Trimph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Emipre Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am coovinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

THE PELTON WATER WHEEL

GIVES THE HIGHEST EFFICIENCY OF ANY WHEEL IN THE WORLD.


A WONDERFUL ACHIEVEMENT IN HYDRAULIC ENGINEERING
A MARVEL OF ENERGY AND POWER
The PELTON WATER WHEEL
SAN FRANCISCO, CAL.

OVER 800 ALREADY IN USE.

Affords the Most Simple and Reliable Power for all Mining and Manufacturing Machinery.

Adapted to heads running from 20 up to 2,000 feet.

From 12 to 20 per cent better results guaranteed than can be produced from any other Wheel in the Country.

ELECTRIC TRANSMISSION.

Power from these Wheels can be transmitted long distances with small loss, and is now extensively used in all parts of the country for generating both power and light.

APPLICATIONS

Should state amount, and head of water, power required, and for what purpose; with approximate length of pipe; also, whether the application is with reference to *Wheels* or *Motors* described below. SEND FOR CIRCULARS.

The Pelton Water Wheel Co.
121 MAIN ST., SAN FRANCISCO, CAL.

THE GATES

ORE AND ROCK CRUSHER

—IS—

THE MOST IMPORTANT IMPROVEMENT

That Has Ever Been Made in This Class of Machinery.

IT WILL DO MUCH FINER WORK

Than Any Other,

AND AT ONE-HALF THE COST IN WEAR.

The Pelton Water Wheel Co.
121-123 MAIN STREET,
San Francisco, Cal.
GENERAL WESTERN AGENTS.

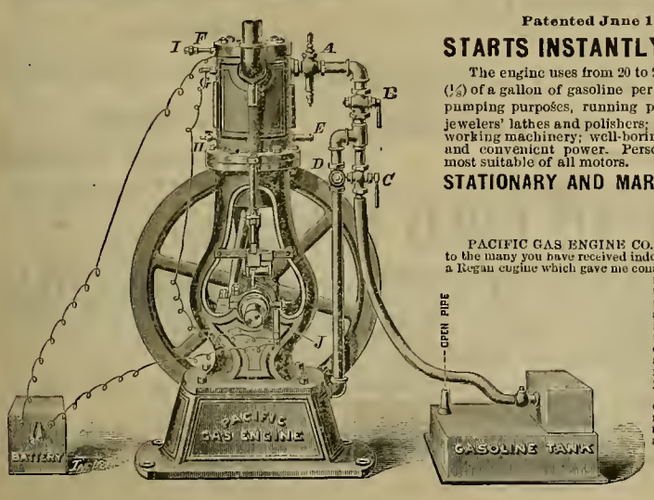
PELTON WATER MOTORS.

Varying from the fraction of 1 up to 15 and 20-horse power. Unequaled for all light-running machinery. Warranted to develop a given amount of power with one-half the water required by any other. ☞ SEND FOR MOTOR CIRCULAR. ADDRESS AS ABOVE. ☜

THE PACIFIC GAS OR GASOLINE ENGINE.

Patented June 17, 1890—Nos. 430,504, 430,505, 430,506. Also in Great Britain and other foreign countries.

STARTS INSTANTLY WITHOUT THE NECESSITY OF BOILER, FIRE OR EXPERIENCED ENGINEER.



The engine uses from 20 to 25 cubic feet of coal gas, or about one-eighth (⅛) of a gallon of gasoline per hour per horse-power. It can be used for pumping purposes, running printing presses, small factories, elevators, jewelers' lathes and polishers; dairymen's, agricultural, mining and wood-working machinery; well-boring and all other purposes requiring cheap and convenient power. Persons having but little space will find this the most suitable of all motors.

USE IN BOATS.—The Company make a specialty of ENGINES FOR SMALL BOATS AND LAUNCHES, and claim there is no engine in the market their superior for this purpose. Boats so fitted require no licensed engineer or pilot, as is required by law for all vessels propelled by steam power.

ELECTRIC LIGHTING.—The engines are PARTICULARLY ADAPTED, and cannot be equaled for operating small electric light plants, either arc or incandescent.

STATIONARY AND MARINE ENGINES FROM 3-4 TO 15-HORSE POWER. OVER 100 IN ACTUAL OPERATION.

READ THESE TESTIMONIALS.

ALAMEDA, April 8, 1890.

PACIFIC GAS ENGINE CO.—GENTLEMEN: Permit me to add my testimonial to the many you have received indorsing your engine. As you are aware, mine was a Regan engine which gave me considerable trouble. I had to remove the head and raise the tappet valve every time I wanted to start the engine. I sent you the engine; you removed all the Regan appliance except the cylinder and stand. You put in your appliances, head, sparking device, inlet valve, and, in fact, changed it to the Pacific Gas Engine, which now works splendidly. I have not had to remove the head from any cause since you made the change (over two months). It gives me no trouble; my boy, 14 years old, attends to it.

The change from the Regan to the Pacific is a decided improvement. I can also get a third more power since the change, and I cheerfully recommend your engine as being simple, effective and cheap

Respectfully yours, B. S. HILL.

Cor. Encinal Ave. and Morton St.

U. S. MARINE HOSPITAL SERVICE, DISTRICT OF THE PACIFIC.
SURGEON'S OFFICE, PORT OF SAN FRANCISCO, Feb. 1st, 1890.

TO THE PACIFIC GAS ENGINE CO.—GENTLEMEN: In answer to your letter of inquiry, of the 23d ultimo, relative to the working of the two-horse power vapor gas engine, recently set up by you at the U. S. Marine Hospital, Mounta n Lake, near the City of San Francisco, Cal., I have to say that, up to date, the engine has given entire satisfaction, developing the power required in the specifications: of "raising 20,000 to 30,000 gallons of water 100 feet high through 600 feet of two-inch iron pipe, to tanks on the hill, in 24 hours." It is more economical than steam, requires less attention, and can be set in operation at a moment's notice.

If it continues to do its work as satisfactory as it has done since December 22d, 1889, when placed in operation, it may be pronounced a perfect success.

Very respectfully, PRESTON H. BAILHACHE,
Surgeon U. S. Marine Hospital Service, Custodian.

PACIFIC GAS ENGINE CO.,
230 FREMONT STREET, - - SAN FRANCISCO,
Send for Circular and Price List.

PARKE & LACY COMPANY

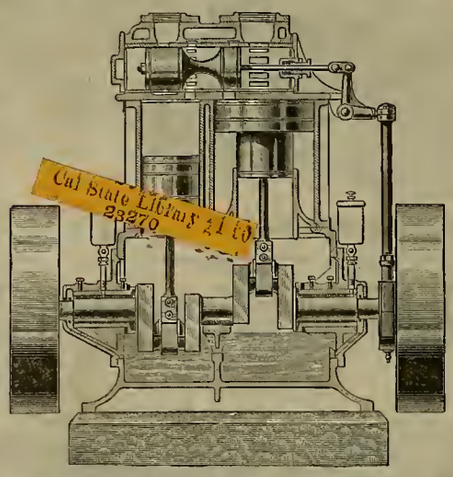
IMPORTERS AND MANUFACTURERS OF

MINING, MILL and GENERAL MACHINERY.

ENGINES, BOILERS, STEAM PUMPS,
AIR COMPRESSORS, ROCK DRILLS,
WALL'S CRUSHING ROLLS,
CONCENTRATORS, PULVERIZERS,
TURBINE WATER WHEELS,
ROCK BREAKERS, DRY JIGS.

Bullock's Diamond Drills

GOLDEN GATE CONCENTRATORS,
GREATEST CAPACITY OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps.



SAW MILLS, MACHINE TOOLS,
PLANING MILLS, INJECTORS and EJECTORS
BELTING, PACKING, OILS, LUBRICATORS,
FIRE EXTINGUISHERS,
CENTRIFUGAL PUMPS
ROTARY PUMPS, GANG EDGERS,
CAMPBELL'S STEAM FEEDS,
MILL and MINE SUPPLIES.

GENERAL AGENTS FOR

WESTINGHOUSE AUTOMATIC ENGINES.

SALES DURING LAST FOUR MONTHS:
COMPOUND, 44 ENGINES, 5215 HORSE POWER. STANDARD, 99 ENGINES, 4500 HORSE POWER. JUNIOR, 166 ENGINES, 4260 HORSE POWER.
Grand Total, 309 Engines, Aggregating 13,975 Horse Power.
21 and 23 Fremont St., San Francisco, Cal. 189 Clarence St., Sydney, N. S. W.

CALIFORNIA WIRE WORKS

ESTABLISHED 1852. INCORPORATED 1882.

MANUFACTURERS OF

Steel Wire Rope,

OF ALL KINDS FOR

CABLE RAILWAYS,
ROPEWAYS and TRAMWAYS,
Mining, Shipping & General Purposes.

WIRE,
BARBED WIRE,
WIRE NAILS,
WIRE CLOTH.
Full Assortment Always in Stock.

OFFICE:
9 Fremont Street, San Francisco.
Send for Illustrated Catalogue.

TRANSPORTATION OF ORE BY HALLIDIE'S PATENT WIRE ROPEWAY.

HALLIDIE'S
PATENT WIRE ROPEWAY,
For the Economical and Rapid Transportation of Ore and other material.

Erected by Us During the Past Fourteen Years in Spans of
200 TO 2,000 FEET.

Simple, Economical and Durable.

HAVE BEEN THOROUGHLY TESTED
In all Parts of the Country.

NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES

For SAVING GOLD!

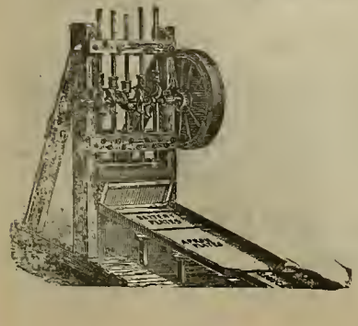
IN QUARTZ, GRAVEL, OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER

AT REDUCED PRICES.

Our platee are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Platee Replated, Bought, or Gold Separated. THOUSANDS OF ORDERS FILLED.

SAN FRANCISCO NOVELTY, GOLD, SILVER AND NICKEL PLATING WORKS,
108 and 112 First St., San Francisco, Cal.
SEND FOR CIRCULARS.

JUSTINIAN CAIRE, Agent,
521 & 523 Market St., San Francisco,
DEALER IN
Assayers' and Mining Material.
MANUFACTURER OF
BATTERY SCREENS AND WIRE CLOTH
Agent for HOSKINS'
HYDRO-CARBON ASSAY FURNACES



IMPORTANT TO GOLD MINERS!

SILVER-PLATED AMALGAM PLATES for SAVING GOLD

IN QUARTZ, GRAVEL AND PLACER MINING.

PRICES GREATLY REDUCED.

Only Refined Silver and Best Copper used. Over 3000 Orders filled. Fifteen Medals Awarded. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated.

These Plates can also be purchased of JOHN TAYLOR & CO., Corner First and Mission Sts

San Francisco Gold, Silver and Nickel Plating Works, 653 & 655 Mission St., San Francisco, Cal., E. G. Denniston, Prop'r.

Our Plates have been used for 20 years. They have proved the best. We adhere strictly to contract in weight of Silver and Copper. SEND FOR CIRCULAR.

CALIFORNIA STATE LIBRARY

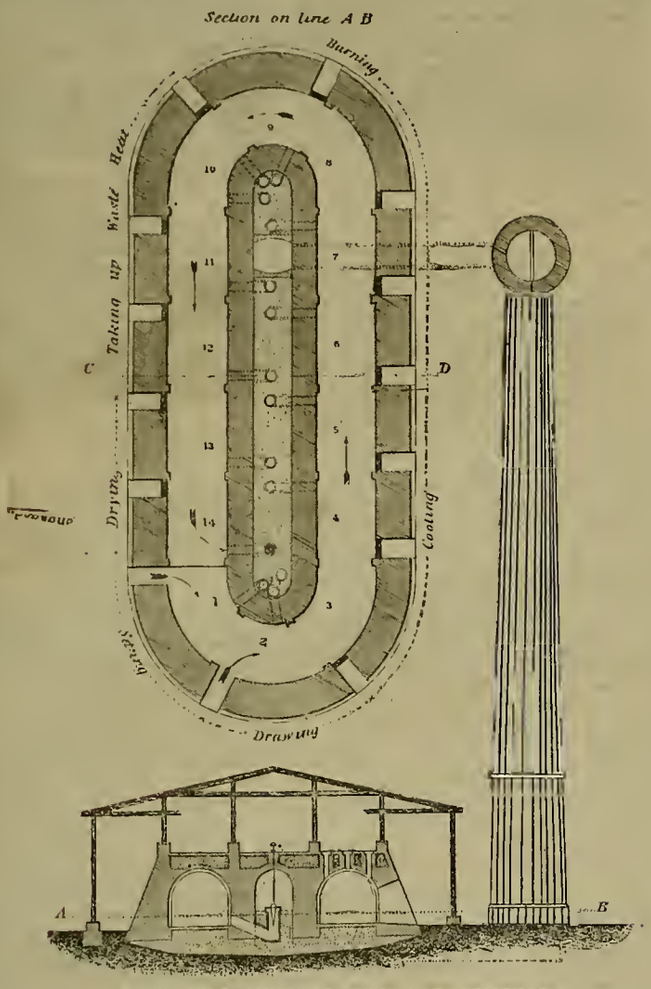
MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 13. DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, SEPTEMBER 27, 1890.

Three Dollars per Annum. Single Copies, 10 Cts.



HOFMANN'S ANNULAR KILN FOR CEMENTS.

The Late Governor Stevenson.

Charles C. Stevenson, Governor of Nevada, died at Carson City, on Sunday morning, of typhoid fever. Besides his political prominence, he was widely known on this coast as a mining man. He was brought up in Ontario county, N. Y., as a farmer, and moved to Nevada, from Michigan, in 1859, crossing the plains with a train that started for Pike's Peak, but changed their original plan when they found that the hubble had burst. They changed their plan again when they found that mines had been discovered at Gold Hill, and instead of coming over to California, went up the mountain and took to mining on the Michigan claim, now one of the Imperial group.

Mr. Stevenson was elected State Senator in 1865 and again in 1877, and in 1874 he was elected president pro tem. In the Senate he showed sterling qualities. He did more to revive mining in Gold Hill and set the stamps at work than any other man. He kept at work on the Kentuck for years during the dull times and was taking out low-grade ore and working it when no other mine on the lead was paying a dividend or ever expected to. When he proved the practicability of working the low-grade ore of the Kentuck ground, it set the owners of Belcher and Crown Point to work also. Previous to that he had worked ore from the old Empire for many years, and gave steady employment to a great number of men. In 1861 he purchased a half-interest in the first quartz-mill erected in Nevada, known as the Coover & Stevenson mill, and has ever since been engaged in mining and milling. He was a man of affairs, energetic and enterprising, and was always an employer of men, instead of himself being employed by others.

Cement Kilns.

The State of California possesses within its boundaries all the ingredients necessary to produce both natural and artificial cement, and yet we continue to neglect the advantages that would accrue to the State from home production, and import thousands of dollars worth of cement annually. What is required is a stone in which the lime and clays are in such proportions that when burned they will chemically react on each other, forming silicates and aluminates of lime. Such a natural combination is seldom found, but those approaching it are of common occurrence, and particularly in this State. Such material can be burned to the verge of vitrification, and the resulting powder is dense and attains increased tensile strength by such burning.

In making hydraulic cements, the kilns principally used in England are "Dome kilns," which are similar in construction, though slightly differing in shape to the "American Natural-Cement kiln." The mode of burning in this kiln is simple. Wood is placed on the grate-bars two feet high, then a layer of coal, on which alternate layers of coke or hard coal and dried lumps are arranged. The proportion of coke to material decreases from bottom upward. About ten per cent of the weight of the raw material of coke or anthracite coal is requisite to burn such a kiln.

A ring kiln is a circular or oval flue (burning chamber) surrounding a smoke chamber, within which circle is a central stack. The burning flue is so arranged that at certain distances it can be separated into sections by dampers which are let in from the top. These sections are connected by smoke flues (having valvular dampers) with the smoke chamber. Each of the burning sections has a doorway through the outer wall five feet high by four feet wide, through which the kiln is loaded and unloaded. The tops of burning sections are pierced with holes for admission of fuel. These holes are three to four feet apart, in three rows, there being from 15 to 21 in each section.

To explain the method of burning in this kiln: Assume the sections of the burning chamber to be numbered 1 to 14. The dampers between Sections 1 to 14 closed (down), and the valvular damper of 14 connecting it with the smoke chamber opened (all the other valves in the smoke flue being closed).

(*Concluded on page 210*)

THE LATE GOVERNOR STEVENSON OF NEVADA.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Silver and Values.

EDITORS PRESS:—Now that silver is rapidly regaining the position in financial affairs which it lost through its demonetization and consequent degradation, it will not be out of place to approximate the loss caused to a part of the producers of the United States during the period of its depression in price.

The British merchant all through this time of depression in silver has sold his gold for silver, and taking the silver, has purchased with it wheat and cotton in India, which he has taken to the British and European markets and sold for gold; thus making a double profit on the transaction—one on the silver and one on the merchandise.

We find on investigation that the average price of wheat, cotton and silver for the ten years from 1869 to 1879 was as follows:

	Wheat, per bu. $1.046	Cotton, per lb. $0.15 17 100	Silver, per oz. $1 2632
Ten years, 1879-1889....	.870	0.10 86-100	1.07
Decline....	.17 6 10	.07 21-100	.1932

As the prices of these commodities are governed by the price for the surplus marketed in competition with goods purchased in a country where silver is freely received at par with gold for similar commodities, it can be readily seen that the shrinkage affects the whole production. With this before us, we can figure what the wheat, cotton and silver producers of the United States have lost in the last decade.

The gross yield of wheat for this period of time, as given by the Treasury Department, was 4 445,150,218 bushels, which, multiplied by 17 6 10 cts. per bushel, amounts to $784,106,418.37.

The gross output of cotton was 28,893 980,064 lbs.; at 7 21 100 cts. per lb. amounts to $2,083,255 962 61.

The output of silver, as per Mint reports, was 371 250,000 oz.; at 19 32-100 cents per oz. is $71,725,530, making a total of $2,939,087,880 98 lost in ten years' time to the producers of these three articles alone. It is true that this immense sum did not all go as profit to our British cousins, but the shrinkage in price made this difference to the people of the United States and was a shrinkage in exchange or barter value that seriously affected them, as is evidenced by the existence of our three billions of mortgages on the farms of the West and Northwest. The statistics on cotton showed that over 67 per cent of the product was exported; on wheat the per cent exported is not given.

It seems, in the face of these figures, that the amount of silver, or its price as to itself, is insignificant when compared with the leverage it gives other commercial nations to reduce the prices of the immense volume of agricultural productions of this country.

The producers of the articles mentioned have been competing against a double profit. The merchant of Great Britain made sufficient profit on silver to enable him to sell wheat and cotton at cost, and as it was to his interest to cheapen silver, he constantly did so by belittling it. It would look as if the Government of the United States could afford to absorb every dollar of silver in existence and issue certificates for it. It certainly would be a profitable transaction for the American producers, for it would take away from their competitors the weapon used to slaughter them. The figures herein given only touch the subject.

Cheap wheat and cheap cotton cheapen numerous other lines. A computation of the losses on them would stagger an ordinary mind.

What I have given here is sufficient to explain why British capitalists have a surplus of funds to invest in the industries of America and to sink in Brazil and elsewhere. We have presented them, through a stupid financial policy, with millions, and now they return it to be invested so that we may work for them and pay them interest on our own money. It is to be hoped that our financiers may continue in their new departure, and when silver gets to par that it will meet a law already enacted giving the silver producer the right of free coinage and the option of standard dollars or certificates redeemable in that very respectable and hard to be got "dollar of our daddies."

J. H TINGMAN.

San Francisco Sept. 18th

Calico Mining District.

EDITORS PRESS:—The Bismarck mine (T. Finnegan) has taken out ten tons of very good ore within the past few weeks.

Preston & O'Day have the Backfoot mine leased for one year. Considerable ore is being developed on this property, which has been a good producer for the past seven years.

On the Silver Quartz mine, John McCall, S. Thomas and John Goodwin are chloriding.

C. Wallace is screening the old dumps of the Cuba mine.

At the Champion mine 150 tons of ore are on the dump, ready for shipment. MINER.

Calico, San Bernardino Co.

Open Letter on Timber-Cutting, Etc.

EDITORS PRESS:—The letter below is of public interest and is fairly typical of many similar inquiries received by this board. We publish it as explanatory of our rejoinder.—WM. S. LYON, for the Board.

SHASTA CO., CAL., Sept. 20, 1890.

To State Board of Forestry—GENTLEMEN: I have read that it is against the law to cut any timber on Government land. Now I would like to have some shakes and have got no timber for the purpose nor money. Can I go up the mountain and cut a sugar pine down and split it up into shakes for my own use? If you please, kindly answer this question for me. Inclosed you will find a two-cent stamp." Respectfully yours, A SETTLER.

Reply.

A SETTLER, ESQ.: Yes, dear sir, your interpretation or reading of the law is entirely correct, and the cutting of that sugar pine upon which you have cast covetous eyes will surely consign you to limbo and the reproaches of all God-fearing citizens. You should know that the deadly machinery of the law is oiled and full-cocked for just such premeditators of evil as yourself. Further, to side-track temporarily the moral featnres of the case, you must not overlook the fact that the tree in question, according to the price the Government sells its timber lands for, represents a national asset of from 15 to 50 cents, this value varying in accordance with its size and remoteness from or accessibility to a market; and that it will only cost the nation from $500 to $1000 to follow, drag you up to the bar of justice and vindicate upon your person or pocket, or both, the majesty of the offended law. The more remote and less valuable the tree, the more certainty there is of your speedy attainder.

Remoteness hath a charm for the Deputy U. S. Marshal; it stimulates the sleuth-like proclivities; it means increased per diems, increased mileage and increased traveling expenses. It gratifies his love for solitary communion with Nature as he finds her in a mountain resort and enables him to shake dice all day under the heading of "incidentals," while gleaning from your dearest enemy the damning chain of evidence that stamps you as a malefactor and felon.

Again there are the very shakes themselves to confront you with; they "split" on you so to speak, and if these he made from a good cut, leave you no knot-hole of escape from the myrmidon who seeks only evidence that convicts, for thereby hangs all of his glory and much of his plunder.

If in the face of this warning you still incline to shelter your head from Shasta's summer solstice or winter's snowy storms, we suggest that you go a step further and add the trifle of arson to your contemplated misdeeds and cover up your tracks with fire.

If a likely, active fellow, and you select the dry season and a windy day, you can start a fire that will quickly wipe out the evidence against you and perhaps a quarter million dollars of public property; the shakes will haunt you, follow you up like an avenging and remorseless Nemesis—the fire, never. They must catch you *in flagrante delictu*, which means that the Government agents must be afield and alert at all times, which would cruelly handicap their social diversions in the mountain saloons, and if you are any way discreet the chances of obtaining direct evidence against you are so slim that you need hardly fear close investigation; the result of impeaching you could only be in the interest of the public good—not the financial gain of the zealous conservator of the public timber who only moves on "dead things."

If you rive out more shakes than you require, by all means try to sell some to your neighbor; incidentally this will clinch the evidence against you but furnish the wherewithal to secure such cold comfort and relief as an occasional stamp invested in the direction of the General Land Office (the proper authorities) may afford.

A correspondent whose moral perceptions are so blunted that he is capable of confessing to both poverty and the attributes of good breeding indicated by the inclosed stamp, is such an anomaly in this generation that we are prompted to look upon your request with some suspicion, and if you would earn aught but the contempt of the public, you must at any rate promptly redeem yourself from the stigma of impecuniousness; buy a flock of sheep and steal pasture for them from the public domain.

If industrious, your flocks can trample out and destroy the forest prospects of Shasta county for generations to come; and if the work of annihilation proceeds not quickly enough, a touch of the torch will accelerate matters and assure you of a grass crop the next season.

Meantime your prestige and standing in the community as a wholesale plundering robber of the public timber lands will entitle you to a consideration at the hands of the General Government that they will never accord to the petit larcenist of a few shakes.

The efforts of this Board to whom your appeal is made have been for some years directed to convincing the Congressmen from your State and district, and who are directly responsible for the present condition of affairs, that a little surveillance of you after you have bloomed out a fire-fiend, pasture brigand and all-around outlaw is a more important matter than a too close scrutiny into how you came by your woodpile or bunch of shakes. So far, they have seen fit to differ from us, and continue to strain at gnats and swallow camels, and the chances are that if you cut that sugar pine, they will strain you so fine through the meshes of the U. S. District Court for the Northern District of California that you will be indistinguishable from a Shasta county gnat. Our advice is that you don't.

STATE BOARD OF FORESTRY,
By W. S. LYON, Forester.

Los Angeles, Cal.

The De Lamar Mine, Idaho.

From the letter of a Boise City, Idaho, correspondent of the Salt Lake *Tribune* we take the following:

Wagontown is down the gulch several miles below Silver City. Its chief property the past few years was the Wilson mine, worked to a small extent. Captain J. R. De Lamar went there four years ago and purchased the Wilson mine, which was then nothing but a mere prospect. He has since then displayed remarkable energy and pluck and succeeded in developing one of the best mines in Idaho, if not of the entire West. He ran a tunnel 1200 feet long to crossent the veins and reach a depth of 400 feet. This tunnel drifts on one of the veins 350 feet in ore. Four levels have been cut, and now he is running another tunnel 200 feet lower than the main one. The tunnel cuts first a vein 15 feet wide, second 19 feet, third 26 feet and fourth 77 feet, while there are several veins from five to six feet each between these. Ore taken from these large veins and milled averages about 13 ounces silver and $20 in gold, and there is enough in sight to keep a hundred stamps running for years. Then there are large deposits of rich silver which is shipped direct to smelters with remarkable returns.

It is not an easy task to convey to the reader an idea of the great value of this property. The formation is in andisitic porphyry, with hanging-wall of iron and clay. And here is one of the remarkable features of the mine: This clay is full of pyrites of iron, and so rich in silver that to place a lump of it in a fire drives out many nodules of silver. In places this clay contact, in a thickness of five feet, yields silver at the rate of $1000 per ton.

There are places in this clay with black nodules of silver looking like small shot imbedded in almost pure clay, while nuggets of silver in value from 25 cents up into dollars are picked out. While this clay predominates in silver, there are streaks of talc which run from $200 to $300 in gold. Mr. De Lamar thinks of converting this clay into brick by burning in a kiln, and then run through the mill to extract the silver. While the main body of the veins produces good milling ore, there are deposits of very rich rock. In operating the 20-stamp mill the past few months, it has produced an average of $50,000 per month in bullion, while there has been shipped ore to the value of $25,000 per month. This rich ore has been taken out of stopes. One of these stopes, 100 feet long, 20 feet wide, and an average of two feet thick, has turned out $350 000 in sacking ore. Think of sending out a carload of ore every few days which nets the lowest about $4000, while the highest runs up to over $18 000 per carload, and this at a small cost of extracting, shipping and working charges. The group covers a space one-half mile wide and one mile long, or did three days ago, but since then a large lot of claims, aggregating about 120 acres, known as the Sommercamp group, has been added by purchase at a cost of $50,000. This gives Mr. De Lamar in all about 450 acres, embracing almost the entire hill, and so situated that his workings can extend entirely through it, with waste dump one side and milling facilities the other. He very wisely secured a large number of mill-sites on the creek, and thus controls its waters by owning a strip of land 300 feet wide and one mile long. On one of these sites is the 20-stamp mill. It is a model in construction and operation. It is 700 feet below the mouth of the working tunnel from which ore is sent down by a tramway 2350 feet long. The actual cost of mining ore is about $1 per ton, and for milling, $3 50 or $4.50 per ton from the mine to the bars of bullion.

At present the property is producing $75,000 per month at a cost of less than $30,000, including all costs of operating and developing. The owner intends to add next spring 100 more stamps and run up the output to $300,000 per month.

A LIBRARY FOR EMPLOYES.—At the general offices of Wells, Fargo & Co.'s Express a room is being fitted up for a library. The library is a recent institution, but has proved a great success. The use of the library is confined to employes of the Express Company. The fee for membership is 25 cents a month. The library is open in the morning before working hours, at noon for an hour and after working hours at night. It contains the leading publications of Europe and America.

THE 12-stamp mill at the Caips mine will soon be completed, says the Sierra *Tribune*, and will be run by water-power from the Yuba river. No. 2 tunnel is in a distance of 350 feet and the ledge crosscutted on the 250 level north and south. No. 3 tunnel, 450 feet lower down the mountain, has been run 400 feet. About 450 feet farther and the vein will be reached.

Railroads Must Not Discriminate.

A result of much importance to shippers by rail has been attained in the Superior Court of Santa Cruz county by which the South Pacific Coast Railway Company has been inflicted with a verdict to pay $8000 because of discrimination and refusal to furnish cars to S. H. Chase & Co. for shipment of lumber from their mill near Boulder creek. It appeared in the evidence that Mr. Fillmore, then manager of the road, had given orders to refuse Chase & Co. cars, and as a reason stated that Chase & Co. were underselling the San Jose Lumber Association, and that by so reducing the price, freight rates would eventually have to be reduced, and therefore he refused to let Chase & Co. have cars. Mr. Fillmore also said that Mr. Chase refused to join the San Jose lumber combination, and told him that if he would join it he would be furnished all the cars he wanted. This Mr. Chase and his partner refused to do.

The case occupied the attention of the Superior Court for over a week, and during the course of the trial Chase & Co. abandoned some of their minor claims for damages, such as for expenses of keeping oxen when the refusal of cars stopped their work, the loss on sub contracts to furnish lumber, etc., and confined their claims to actual damages caused by the loss of business and for punitive damages.

Judge McCann delivered a lengthy charge. The jury retired, and in two hours returned with a verdict for $8000 in favor of the plaintiff. The jury stood nine to three. Chase & Co. claimed $9706 actual damages and over $40,000 as punitive damages.

Though the verdict hardly covered the actual loss to Chase & Co., and though the company will probably fight the issue further, it is some satisfaction at least to have a verdict declaring that discrimination and the attempt of a transportation company to rule production and commerce instead of serve them are illegal. The country has suffered considerably by such discrimination and almost conspiracy between favored shippers and the railways against the business of other producers and shippers. The issue should be pushed in the public interest until common carriers are taught that they must treat all shippers fairly and impartially.

Mount Conness.

Prof. George Davidson and party have just returned from a scientific expedition to Mount Conness, where they had been [illegible] for a month in giving a maximum trigonometrical strength to the west end of the great arc of the parallel stretching from the Pacific to the Atlantic, on the 39th degree of latitude.

The work was one of great difficulty, for the trails leading to the summit had not been used for three years and had been nearly obliterated in places by the severity of the winter storms. Two whole months were occupied in clearing the way, and even then considerable difficulty was experienced in transporting the apparatus to its destination.

Though called a mountain, Mount Conness is nothing more than an immense shaft of granite rising perpendicularly 1300 feet from the tablelands. The sides of this gigantic pillar are weather-worn, split, cracked and fractured in every conceivable manner. Great masses are ready to topple by the addition of another pound on the outer edge; slabs of 100 feet in hight seem ready to fall off by the leverage of a crowbar, and on the crest-line trail to the summit the advance were afraid to use a blast, so torn and broken and toppling did it seem. Nevertheless a trail was cut and a house for the instruments was erected on the very pinnacle, where there was but eight feet of standing-room. A considerable part of the trail is but 18 inches wide over a perpendicular abyss of from 800 to 1200 feet, along which the heliotrope and other cumbersome instruments were carried without injury.

After the road was opened many visitors made the journey to the summit, among them being two ladies, one of whom hails from this city.

The River Mills.

The Carson *Appeal* gives the work now being done by river mills. It says:

The following figures will show what is being done, and the present condition of things indicates that it will continue to be done for some time to come:

Eureka mill—Con. Cal. and Va. ore; 260 tons per day.

Douglass—Tailings; 200 tons per day.

Brunswick — Yellow Jacket and Overman ore; 200 tons per day.

Mexican—Savage and Crown Point ore; 125 tons per day.

Morgan—Tailings; 100 tons per day.

Rock Point—Savage ore; 60 tons per day.

Vivian—Belcher ore; 40 tons per day.

These figures are likely to increase in a few days, and will in all probability double if silver continues to rise as rapidly as it has of late.

Each mill has on a heavy force of men, and laborers who have heretofore been idle are now holding lucrative positions.

LEASING continues to be on the increase throughout the camp of Butte, and at the present rate there will soon be but few of the old mines idle.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XII.

[Written for the Press by James H. Crossman.]

Ord Mining District.

This district, on Ord mountain, comprises within its boundary lines an area of 342 square miles of mineral territory, the larger portion of which is unprospected. The district, as well as the mountain in which it is situated, derives its name from General Ord, U. S. A., who in 1866 commanded a military post (during a period of Indian hostility) at Camp Cady, a station on the Mojave river. The tribe of Indians that roamed over and inhabited this desert region were the Pintes, who were at that time numerous and on the warpath.

A detachment of scouts detailed by General Ord to investigate the mountain where Indian signal fires were frequently seen, on their return reported the mountain to be an Indian stronghold, also that it contained numerous springs of running water, and that while traversing the northerly end of the range they noticed a long line of croppings of a strong vein whose comb could be traced for several miles. On examination the rock showed particles of gold and also copper stain. A subsequent examination of the locality determined its location to be on the westerly extremity of the mountain range in Tp. 7 N., R. 1 E., at an elevation of 4500 feet above the level of the sea, and at a distance of 7½ miles in an air-line southerly from Daggett on the Mojave river, now a station on the Atlantic & Pacific railroad. This mineral discovery of the scouts soon became known. Miners and prospectors flocked in. The Indians left for some other locality. A mineral district was soon after formed which was given the name of the commander of the post (Ord). Locations were made, but the mines, though abundantly rich in copper and gold, were too far from a base of supplies to prove remunerative.

The locators being men of limited means, their capital soon became exhausted, and but little was accomplished toward actual development. At a later date J. B. Osborne, the well-known mining operator of the desert regions, formed an association with H. L. Drew, a capitalist of San Bernardino, as a partner, and commenced purchasing the locations. They succeeded in absorbing all of the most prominent mines of the district, and patented a number of them.

They commenced a systematic work of development and at date have expended a figure in excess of $70,000 in opening the mines, building roads, etc. A graded road to Daggett measures on the contour line 14 miles, over which the ores of the mine can be transported for a figure less than $1.50 per ton.

The purchases and locations of Messrs. Drew & Osborne are as follows: The Brilliant, Tehachipi, Modesto, Josephine, Last Chance, Coupon, Central, Rio Vista, Painsville, Empress, Cliff, Bluff, Sweetwater, Posy, Sonflower, Aztec, Coldwater, Bluebell, Keystone, Climax, Point Conception, Atlantic, Souset and Wide West. They have numerous springs of water and territory suitable for townsites and reduction works—in fact these gentlemen are virtually possessors of a principality of mineral wealth. Of the 24 enumerated mining locations, nine have been patented and all have more or (yellow and peacock), metallic copper in scales and powder—all carrying more or less gold in combination. The average yield of the metallic copper which is found at a depth of 250 feet in the Rio Vista mine is significant, when we take into consideration that the stamp work of the celebrated Calumet & Hecla mine of Lake Superior yields only from 4 to 5 per cent of this metallic product.

Of the group, the Coupon is the most important copper mine, showing a width of vein stuff between its incasing walls of 100 feet, with concentrated ore in bands and streaks of varying widths from 8 to 30 feet, with stringers and spurs occurring forming feeders which fall into the vein at its greatest point of expansion. Average samples taken from several openings on the mine of varying widths from 8 to 20 feet, gave the following returns, as assayed by Thomas Price & Son, San Francisco:

	Silver and gold values.	Copper.
1—Coupon	$5 97	11.1-10
2— "	4 83	9.2-10
3— "	—	10 51
4—Rio Vista	7 34 metallic copper	11.85

The gangue of the Conpon mine is of a character that admits of concentration to a high percentage before going to the smelter. These ores carry their own flux, iron and silica, with an abundance of lime, in the form of spar, which forms the west wall of the Conpon vein. It reaches its greatest expansion at a point where the Tehachipi intersects the main ore channel. (See plan.)

Development.

All of the principal mines have been sufficiently developed by shafts, crosscuts, levels, fissure. The ores of this mammoth vein contain copious development, exposing immense quantities of copper and gold bearing ores.

Gold.

The principal and most developed are the Atlantic, Sunset, Point Conception, Rio Vista and Painsville mines, which carry an average grade of ore sufficiently high in the precious metal to warrant their transportation, if necessary, to the Mojave river for reduction.

Samples were taken as average from the above-named mines and assayed at Messrs. Thos. Price & Son's assay office in San Francisco, with the following results:

Name of mine.	Silver.	Gold.	Total.
Sunset	$1 70	$22 74	$24 44
Rio Vista	10	14 47	14 57
Point Conception	5 50	10 34	15 84
Painsville	20	22 74	22 94

Copper returns not given, though the ores contained an appreciable quantity of that metal.

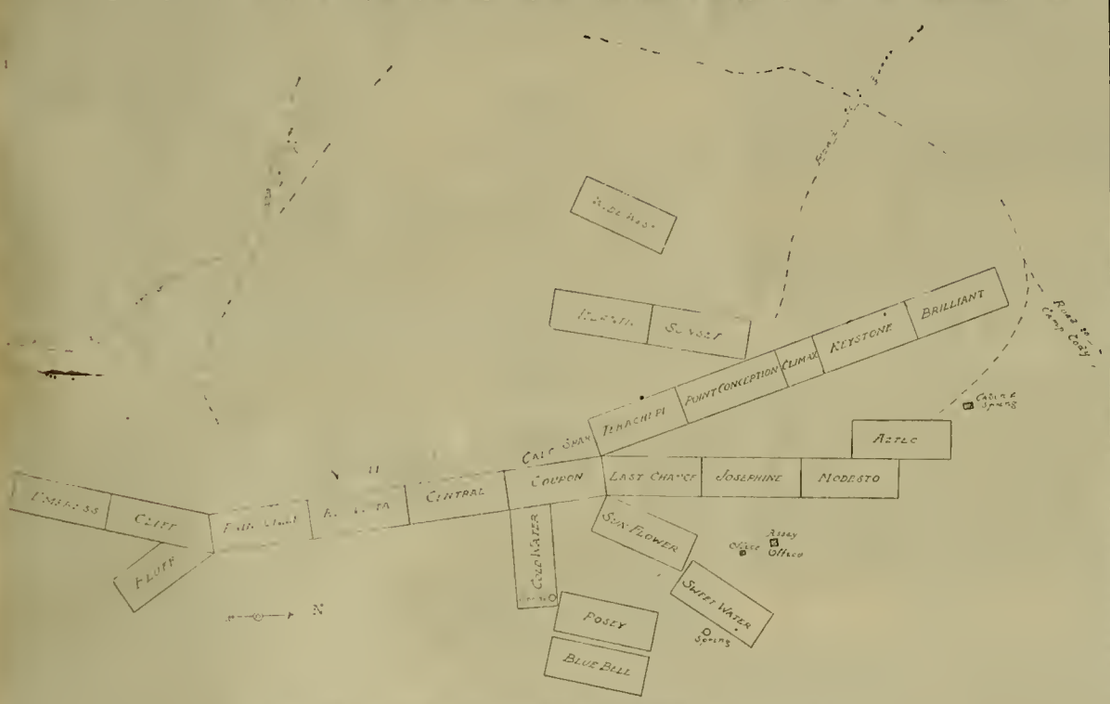
Copper.

While the enumerated mining locations all carry the ores of copper and gold, the mines in the main arterial lode comprising the Modesto, Josephine, Last Chance, Conpon and Central, with their lateral branches and spurs, have greater values for their copper product than for the precious metal. They are essentially copper mines, though as a rule of medium grade. Their lineal extent, great width and immense reserves warrant the erection of an extensive reduction, concentration and smelting plant. These ores consist of oxides (black, red and gray), carbonates (blue and green), sulphides per, gold and silver. The chimneys of ore are the black, ponderous metallic product in chunks, and angular fragments strewn over the surface. We reach a vein of massive mineral that measures from wall to wall 30 feet. This location is known as Dick Turpin No. 1. We follow its course on a descending grade in a westerly direction, and the vein expands and increases in size until at the boundary line between Turpin Nos. 1 and 2 it has reached a width of 80 feet, gradually expanding until at the northerly extremity of No. 2 claim it attains a width of 400 feet. Two locations have also been made on a twin vein known as Tip Top No. 1 and No. 2. The ores are of a similar character, highly magnetic and remarkably free from sulphur or phosphorus; here the needle is inoperative—the polar star has no longer any attraction. In places on the Tip Top the ore changes to a soft gray iron ore known as "nut ore."

The iron vein outs the mountain slope diagonally, disappears, and is covered by the debris of the desert plains. Another location in the vicinity is known as the Bessemer, showing a strong body of ore.

Four miles southeasterly from this point and on the same line of strike an extensive body of a similar character of ore occurs; it is from 20 to 100 feet in width. All that is required to make this immense body of iron available is railroad transportation, fuel and water. It lies on the borders of Rabbit Spring valley with a smooth and level road to Victor, a station on the line of the California Southern R. R., 36 miles distant in an air-line and about 42 in its contour. The gold and copper of the Ord group and the iron of Iron mountain will at no distant day warrant the construction of a railroad to these important properties.

(To be Continued.)



THE MINES OF ORD DISTRICT, SAN BERNARDINO COUNTY, CAL.

drifts and quarries to denote their character as true fissure veins of unusual width, persistence in depth and longitudinal extent. The values of the ores have been repeatedly proved and tested by chemical analysis and working tests.

The main arterial lode coursing longitudinally with that portion of the range in which it occurs, has been bisected and eroded by a ravine to a depth of 800 feet below the outcrop of the southerly location. This affords facilities for extending an adit southerly from the northerly exposure of the vein in the Point Conception mine on and in the vein to the full extent of the claim in that direction, passing longitudinally through the rich chutes of ore found in the Point Conception, Tehachipi, Coupon, Rio Vista, and at a distance of 8500 feet from its mouth give a vertical hight of 700 feet in the center of the Painsville mine, allowing four inches of grade to the rod.

Another important site for an adit would be at a point on the east slope of the divide opposite the Josephine mine, where a crosscut through the country would intersect the vein at a distance of 150 feet; thence southerly on the line of the main ore channel. In either of these adits the ores could be moved by gravity from mine to reduction works, the adit serving as a conduit for the passage of the water of the mine to the work.

Geological Features.

Ord mountain, at its greatest elevation, reaches a hight of 6300 feet. Its strike is northwest and southeast, its axis granitic, its make-up a heterogeneous mass of a great variety of rock, with but little apparent order or system. On its northeasterly flank an extinct crater of considerable dimensions occurs that at no remote period poured forth immense quantities of molten lava, covering the face of the country for many miles in a northerly direction. Its northwesterly borders have been traversed longitudinally and transversely by a mammoth of considerable longitudinal extent and of great width. The strike of the lode is N. 5 W. and S. 5 E. The greatest expansion takes place where the Tehachipi mine intersects the Coupon at an acute angle. The vein is traceable by croppings and float for the entire distance from the Empress on the south to the northerly boundaries of the Point Conception and the Josephine mines, where it dips and is covered by the alluvions of a deep ravine or wash, to reappear again on the opposite bank in the Modesto and Brilliant locations. The lineal extent of the main arterial lode is 19,600 feet; northwest branch, 6000 feet; parallel lode, 3000 feet; adjacent and auxiliary location, 10,500 feet, or 39,200 feet in all.

The numerous springs that break out from the mountain-side indicate an abundant supply of water for all practical purposes.

Iron

That the mineral wealth of Ord mountain is not confined exclusively to the cupriferous, auriferous and argentiferous veins is demonstrated by the recent discovery of immense veins carrying the most valuable of all of the ores of iron (magnetites and hematites).

At a point on the westerly slope of the Ord mountain range, known as Iron mountain, 14 miles in a southeasterly direction from the Ord group of copper and gold-bearing mines previously described, and 18 miles southeasterly from Newberry station on the Atlantic & Pacific railroad over a road of easy grade, this important development occurs.

Eight miles distant from the mines in question the rocks show every evidence of the powerful effects of volcanic disturbance. Crossing the divide eight miles westerly from its summit, all evidence of subterranean heat and metamorphic action has disappeared, the axis of the range is granitic and the granite is in place and unchanged; at an elevation of 3350 feet (aneroid readings) we note the first evidence of

Eureka District, Nevada.

The Eureka *Sentinel* says: From the year 1864 up to the present time about 4500 mining locations were recorded in Eureka county, nearly 4000 of that number having been recorded in Eureka district. A large number of the latter were located during the most prosperous period of the camp, for speculative purposes only, that were never touched with a pick or shovel, but were abandoned. A large number of abandoned claims were several times relocated, and many bona fida claims were partly developed and consolidated or merged into companies. At no time were there ever more than 400 producing claims in the county, and at the close of last year less than 70 mines were producing ore. There are several reasons for this decline, principal among which were the low price of silver that was caused by its demonetization in 1873, high prices of fuel for the reduction of ore, high rates of transportation, discrimination of the Southern Pacific R. R. Company against us, and exorbitant charges and discounts made at our local reduction works which were the outcome of the other causes. There are a large number of claims in this district that formerly produced ore in abundance which have lain idle for years past. They did not pay to work under the circumstances above related; but all of the detersive causes have been removed, and there remains no good reason why they should not now be reopened and become productive and profitable to their owners as well as beneficial to the camp.

THE LOW ADJUSTABLE CAR.—Some time ago an account was published in the MINING AND SCIENTIFIC PRESS of the trial trip of the first one of these cars built, and the car was then pronounced a success. That car has been in regular service ever since on the Omnibus cable road in this city, giving great satisfaction, and the almost instantaneous transformation of this car from a beautiful open summer car to a perfectly closed or winter car may be seen daily when in use on the road. Two roads in Portland, one in Washington and one in Southern California are being stocked with the Low adjustable patent cars. Carter Bros. of Newark and the Stockton Car and Agricultural Works are prominent builders. Mr. Low states that the company has no agents except himself. No manufacturers have exclusive rights. Owners of roads paying royalty get the cars manufactured where they please at present.

THE Union Mill Company of Tuscarora district, Nevada, has organized with the following directors: Thos. Bell, P. C. Hyman, Geo. W. Grayson, E Scott and F. A. Berlin. Thomas Bell has been appointed president, P. C. Hyman vice-president, R. R. Grayson secretary and H. W. Coffin superintendent of the mill. The Union mill is owned by the Commonwealth, North Belle Isle and Nevada Queen Mining Companies, each of which holds in its treasury one-third of the 100,000 shares of the capital stock of the mill company. On October 1st the mill, which is now being run by the Commonwealth Company for the owners, will be turned over to the new company, together with all supplies, etc. The rate for working ore has been established at $25 per ton.

WELL DONE.—In the U. S. Senate on Tuesday of this week, the House Anti Lottery bill was taken from the calendar and passed without a word of discussion.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AMADOR GOLD.—*Ledger*, Sept. 20: Company have received the following cablegram from James E. Dye, agent at the mine: "Mill has run 60 days to August 1st; 45 stamps running day and night; 6750 tons of ore have been treated. Net profit to Amador gold mine (limited) $30,000." The above is a remarkable showing, if true. The managers never calculated upon ore exceeding an average of $4 per ton, yet according to the above report the profits of the first two months amount to over $4.50 per ton. We hope the dividend of sixpence per share just declared is the result of actual mining. Stockholders in England have written us in regard to the genuineness of this action of the company, and we regret that we are not in a position to set doubts on this proposition at rest.

SUTTER CREEK.—Cor. *Ledger*, Sept. 20: Grading for the additional ten stamps at the Wildman mill was finished to-day. The carpenters are busy framing the timbers. Knight & Co. have contracted to have the mill in running order by the first of November. The completion of the ore bin has been somewhat delayed on account of being short of one or two large timbers. Superintendent Tregloan informs your correspondent that he is confident of having everything in operation before the winter rains set in. Drifting at the North Star has commenced in earnest. Two drifts in almost opposite directions have been started, with three eight-hour shifts, and work is to be pushed with all possible speed.

FROM VOLCANO.—Mining in this district has been somewhat at a standstill for some time, but there will be a great change this coming winter, as they have been hauling logs and blocks all this summer for the Tunnel Co. I hear that they intend to employ about 25 more men.

DRYTOWN.—Mining in this district is nearly at a standstill. The only claims being worked in the immediate vicinity are the Gover and Tip Top, a new company composed of M. C. Randolph, Fred Bockers, Henry and Milton Dickerman, who are doing some prospecting near the Black Hills. They have fitted up the Seaton mill and will begin crushing rock some time this week. They expect to take out some tip top rock, hence the name.

Calaveras.

MILL RUNNING.—Calaveras *Chronicle*, Sept. 20: The 10-stamp mill of the Sandy Bar Mining Co., which has recently been completed, commenced to drop stamps steadily this week.

Inyo.

SYLVANIA DISTRICT.—Cor. Inyo *Register*, Sept. 18: Several changes have been made in the management of the Sylvania Co.'s affairs here. Work has been resumed on the Climax mine, and the tunnel is being extended toward the ledge as fast as three eight-hour shifts can push it. A day shift is also sinking a shaft on the ledge and taking out ore. The shaft on the Liberal mine has been straightened to a perpendicular and substantially timbered. Friday, the 12th, was a day that should be recorded as an important one in the history of Sylvania mining district. During the forenoon Engineer Jas. Knapp got up steam, and shortly before noon quite a crowd of Sylvanians gathered at the Liberal shaft. At 11:40 Mrs. George Futler, one of Sylvania's handsome ladies, placed her hand upon the throttle valve and had the honor of being the first one who ever caused an engine to turn a wheel in Sylvania district. At 12 o'clock all the ladies in the camp took hold of the whistle cord, and with a "strong pull, a long pull and a pull altogether," they made the hills ring with reverberations from the first steam whistle that ever sounded in Sylvania district.

BEVERIDGE DISTRICT.—Some rich ore is being taken out in Beveridge district. Recently J. Stansbury sent down several tons that netted 367 ounces silver per ton. A miner named Jolhurque sent out a lot that paid him 373 ounces per ton. This ore comes from a short distance east of the Keynot mine.

Mariposa.

ANOTHER QUARTZ-MILL.—*Gazette*, Sept. 20: The new mill at the Malone mine started up last Wednesday and the prospects are good for a successful run. They have good rock, and it is said, enough of it to pay the owner handsomely. The Malone mine gives employment to about 20 men, which is quite an item these dull times.

Modoc.

CEDARVILLE.—Cor. Aden *Argus*, Sept. 20: A gentleman has begun work on what is known as "Forty-nine" ledge, in "Forty-nine" canyon, directly east of Cedarville. Twenty-four years ago, while on a prospecting tour through this region, he found the ledge and sunk a shaft 50 feet deep on it. He then abandoned operations and left the country; and now the whirligig of time brings him back again to renew the labor of 24 years ago. He is very sanguine and has men at work running a tunnel into the shaft to drain it of the water. He says the ore he took out of the shaft assayed over $40 per ton, and he looks for it to grow richer as he goes down on it.

Nevada.

SPECIMENS FROM THE SEVEN-THIRTY.—*Tidings*, Sept. 20: Wm. Hammill, who, with John Rawling, James McLachlan and others, is opening the old Seven-Thirty mine on Deadman's flat, under lease, brought to town to-day a quantity of very rich rock. The ore came from a 10-inch ledge at a depth of 140 feet and is "lousy" with coarse gold. In character the quartz is dark and water-stained, and, filled with gold as it is, it reminds our old citizens of the early days of the Seven-Thirty, when a fortune was taken out from the superficial workings. For three or four months Messrs. Rawling & Co. have been doing deadwork, and now they are prepared to go right ahead with operations on the ledge.

YOU BET NOTES.—We learn from Jerry Goodwin that about 40 men are working in the You Bet drift mines, and all making good livings. Mr. Feely employs 18 men, having cut his force down from 30, the necessity heretofore existing for doing considerable deadwork having been overcome. The mine is paying. Mr. Goodwin is opening his old mine and as soon as the necessary preliminary work is accomplished will give employment to quite a number of men.

HARTERY MINE.—Grass Valley *Union*, Sept. 20: The Larimer mill, leased by the Hartery Co., began the work of crushing ore from the mine this morning. There is considerable ore on the dump at the mine, probably about 50 tons, and it will be put through as rapidly as possible. The Hartery is clear of water and it takes but a very slow movement of the pump to keep it so. Ore is now being taken out of the north and south drifts of the 600 level, where stoping is going on. The ore now being hauled to the mill is not up to the average ore in the mine by any means, and is only expected to pay a little more than expenses.

Plumas.

PIPE TO LITTLE JAMISON.—Greenville *Bulletin*, Sept. 20: Last week G. P. Cornell went to Big Meadows and purchased 2000 feet of 22-inch pipe belonging to the Dutch Hill mine. Teams have been engaged to haul it to the Little Jamison mine, where it will be used in supplying water-power to that property. Mr. Cornell is pushing work on the Little Jamison as fast as possible. About 75 men are now at work. The company is building hoisting works and sinking a shaft.

THE LITTLE JAMISON.—This mine is situated on Little Jamison creek on the opposite side of Jamison creek from the Eureka, of which it is supposed to be an extension. It was discovered many years ago and worked as a gravel mine. A few years ago, while so working it, a large ore vein was discovered in the bed of the creek. This ledge is supposed to have been the feeder of the rich gravel deposits below. The property became involved in litigation, and not until a few months since was it extricated. G. P. Cornell succeeded in harmonizing the factions and consolidating the interests, and now the work of developing the mine is progressing very favorably. A chain of four small lakes, already connected by Nature, will furnish ample water for all purposes. A force of men is now cutting a ditch from the lowest of the series of lakes, round to a point on top of a hill, near the mine. This will give 500 feet pressure and furnish, without exception, says the engineer, the finest water-power in the county. The object of the large flume is to take up the waters of Little Jamison creek, above the mine, so as to drain the property. The flume will be about 1000 feet long. About 50 men are now employed doing preliminary work. Mr. Cornell is the head of the company; Thos. Jenkins, secretary; T. B. Inch, treasurer; and Mr. Stanley, the local superintendent.

San Diego.

AT JULIAN.—*Sentinel*, Sept. 19: J. J. Minear, who purchased a group of mines between Julian and Banner, will arrive this week with a complete outfit for working the property, including a quartz-mill. He also brings his own wagons and teams. The outfit is in charge of six men. Such additions to our already lively camp are always welcome.

Shasta.

IGO.—Cor. Shasta *Courier*, Sept. 20: Robinson & Co. are still crosscutting from the bottom of their shaft and intersecting numerous seams of clay carrying some mineral. P. Gibney has all his claims surveyed, and will apply for patents in the immediate future. Shirland's arastra is running on Creighton ore. E. L. Ballou's arastra is running on ore from his Manzanita ledge. Litten & Moody are building an arastra between the old Continental and Chico mills to run on ore from the Continental, and surface ore from several other claims adjacent thereto. The Euhanks boys are building an arastra on Andrews creek, above their house, to run on Live Oak ore. Doc Dunham has bought out Whit George at Muletown, and is shipping sulphuret ore. Whit George, Hopping & Co. are drifting on their ledge with good results.

Sierra.

EXTENSION TUNNEL. — *Mountain Messenger*, Sept. 20: Thirty feet were made, last week, in the Bald Mt. Ex. tunnel. A hard spur of rock, 16 feet wide, was passed when soft quartzite rock, sparkling with sulphurets, was encountered and water increased. The tunnel is in about 4631 feet, crossing the ridge, headed west, and is probably near to or in the rim of the channel. The track is planked and mules haul out the trains. A two-foot quartz ledge was lately struck. Supt. Meikle has returned from Nova Scotia and resumed charge of the mine. Under his careful and energetic management the Ex. Co. is slowly but surely pressing on to glorious victory that none will begrudge the tireless and ever-persevering stockholders, who have never failed to pay off their men at the close of every month, settle all other indebtedness on or before it was due, nor employed a Chinaman in more than 17 years of extensive drift mining—a record of which they may well be proud—one of the most honest and deserving home companies ever incorporated in Sierra county. During the absence of Supt. Meikle, work has progressed satisfactorily under the able supervision of J. A. McDougall.

THISTLE SHAFT, a mile and a half below Gibsonville, is down about 400 feet, through pipeclay to gravel, with 13 more feet of pipeclay below, after which all will be gravel. Just now 150 gallons of water a minute is being pumped out of the mine, temporarily retarding work. The recent cleanup at the Wm. Tell quartz mine, probably an extension of the Sierra Buttes ledge, Sierra City, for the past three months was $1400, with a small working force. W. M. James is reported as having returned to Sierra City from Shasta county to remove his family to that part of the State, where he is superintendent of the Uncle Sam quartz mine, near Redding, owned by the Sierra Buttes Co.

Siskiyou.

ORO FINO.—Siskiyou *Telegram*, Sept. 20: The Allen Bros. mine has yielded an average of $43 to the ton all this season. They have about 600 feet of the same kind of ore to stope out. They reduce the ores in two arastras. Wright & Fletcher will soon begin to fix up for next season's work. Eastlick Bros. will also soon be at the same work. R. H. Campbell started in last week to open up the Hull Gulch mine in Quartz valley. He will drift the Luke Shaw mine and hydraulic the Hull gulch. He ordered 60,000 feet of lumber from Morrison's mill for flume purposes, and it will take at least three months to get the same in order for mining. The Luke Shaw mine prospects better than ever at present. Theodore Demming will soon commence operations at the Gardner mine in the Pinery.

QUARTZ AND RIVER MINERS.—Yreka *Journal*, Sept. 19: Fagundus & Co., who own a quartz ledge in the Salmon river section, near the old Klamath ledge, have been taking out very rich quartz lately. The Schroeder & Werner ledges on Deadwood still continue to pay handsomely, a large force of men being employed day and night, with the steam mill running constantly. The river miners on the Klamath are all down to bedrock in the old channel, and we may soon anticipate a great amount of gold dust from that section. The Spencer mine at Humbug Creek still continues to yield rich pay from quartz taken out. Over 50 tons have been crushed lately in McCook's mill at Forks of Humbug, 24 of which were bedrock and porphyry, the latter paying about $50 a ton, while the quartz paid over $80 a ton. The ledge is from 3 to 4 feet wide, and appears to be gradually improving as the work of going down deeper progresses. It is the best paying quartz mine in the county at present, and this fall a large new quartz-mill is to be erected, and a larger force employed to work the mine. The Boyle & Co. quartz mine at the head of Humbug is also paying handsomely, their mill being kept in constant operation day and night.

Tuolumne.

POCKET.—Tuolumne *Independent*, Sept. 20: A $2000 pocket was taken out of the old Fuchs mine at Sawmill Flat recently. This mine is now the property of Dave Oliver of Sonora.

THE ALAMEDA.—Mr. M. B. Harriman has become sole owner of the Alameda mine, on the mother lode near Jamestown. The mine contains a large body of high-grade ore, and is undoubtedly a valuable property. Mr. Harriman intends to develop this mine as soon as his lease on the Bonanza mine expires.

GOLDEN GATE.—Messrs. Hayward & Hobart, well-known mining men, were in town this week negotiating for the purchase of the Golden Gate mine. Whether they succeed or not is not definitely known. It is rumored that they have offered $350,000 for the property, if after sinking 300 feet deeper, the mine suits them as well then as it does now.

NEVADA.

Waehoe District.

ALTA.—Virginia *Enterprise*, Sept. 20: Drifting northwest from the winze on the 1000 level. Stopes yielding 318 tons of ore weekly of the usual value, all of which is being crushed.

LADY WASHINGTON.—Crosscutting on the 825 level of the New York shaft, and cutting quartz stringers assaying from $1.50 to $11 a ton. It is believed that by following the strongest of these stringers in their depth, a strong body of ore will be found.

CROWN POINT.—The 300 east and west stopes look about the same as last week. The rock is still low grade, but hope in a few days to reach a point in the west stope on the sixth floor, below which the ore is of much better quality, and which we expect to find extending upward. Shipped to the mill during the week 398 tons and 1480 pounds of ore, the average battery assay of which was $12.40.

BELCHER.—Shipped to the Vivian mill during the week 274 tons 900 pounds of ore, the average battery of which was $31.68. This battery does not represent the value of the ore in the stopes, but is due to the shipment of the ore that has been stored on the 1300 level since the latter part of 1887, and which was extracted from the rich streak in the 1300 raise at that time. This is the first opportunity we have had to mill it.

ANDES.—During the past week on the 420 level the north drift from No. 1 crosscut was extended 6 feet; formation, porphyry and quartz. A south drift is started from No. 1 west crosscut, and is out 10 feet; formation quartz, giving low assays.

CON. IMPERIAL.—The raise from west crosscut No. 2, 750 level, is up 13 feet, having been commenced during the week; the top shows quartz of no value. East crosscut No. 1 and west crosscut No. 1, 1000 level, are being repaired.

CHALLENGE CON.—The joint Yellow Jacket and Challenge west crosscut No. 1, on the 1000 level, is out 92 feet, having been advanced 28 feet during the week, the face showing quartz of no value.

YELLOW JACKET.—Shipping 80 tons of ore daily to the Brunswick mill, and doing very extensive work throughout the mine. Are employing 180 men in the Jacket, Challenge, Confidence and Imperial.

OVERMAN.—Extracted 240 tons of ore; car samples average $18 per ton. Shipped to the Brunswick mill 317 tons and 1760 pounds of ore. Battery assays, $17 per ton. On the 1100 level the incline upraise from the south drift has been extended 8 feet; total, 48 feet, with 2¼ feet of good ore showing in the face of the upraise.

JUSTICE.—Shipped to the mill during the week 196 tons and 1225 pounds of ore. Average battery assay, $25.29 per ton.

SAVAGE.—On the 1300 level the southeast drift from the Savage shaft was advanced 293 feet and connected last Saturday with the north drift from the Hale & Norcross side. This connection has greatly improved the ventilation on this level. In about a week we will have this drift timbered and prepared so that we can commence extracting ore through our own shaft from the new find on this level. During the week we have hoisted from the 500, 600, 750 and 1300 levels 902 cars of ore; shipped to the Rock Point mill 385 tons and to the Mexican mill 388¼ tons. The Rock Point milled 295 tons and the Mexican 388 tons; total, 683 tons. Average battery assay, $18.63. We have bullion on hand and at the mill amounting to $19 300.

HALE & NORCROSS.—On the 900-foot level the west drift was advanced 35 feet. The face is in vein material. We have resumed work in the face on the north drift on this level, and advanced the same 38 feet. On the 1100-foot level the west drift was advanced 35 feet. This drift has passed through 25 feet of quartz giving low assays. On the 1350 level the west prospecting drift 60 feet north from the station was advanced 25 feet. The face is in porphyry. The east crosscut opposite the shaft on this level was advanced 25 feet. The face is in porphyry and stringers of quartz. Ore shipments were discontinued on the 8th inst. During the week we have hoisted 16 cars of ore; shipped to the Nevada mill 105 tons and milled 170 tons. Average battery assay, $10.47 per ton. We have bullion on hand amounting to about $7200.

UTAH.—The main south drift has been extended 49 feet, total, 58; continuing in porphyry showing clay slips.

OCCIDENTAL.—The stopes on the 400 level, and particularly on the 4th floor, are yielding ore of good quality. At a point in the north drift on the 400 level, about 200 feet from the north line in, a winze has been started in high-grade ore. On the 400 level good ore is being extracted from the 6th and 8th floors. We are now getting the mill in order, and expect to start crushing ore on or before October 1st.

BEST & BELCHER.—At a point in raise No. 1, 45 feet above the 1200 level, west crosscut No. 1 was started and advanced 20 feet; formation, clay and porphyry.

CHOLLAR.—The pay stopes are yielding the usual amount of ore giving the average assays. Sent to the mill 470 tons of ore, the average battery assay of which was $18.98 per ton.

POTOSI.—Have completed timbering 1130 winze station, and started lateral drifts north and south from the west of the pay. They are in 12 feet; face in porphyry with seams of quartz through it. Have resumed sinking the winze, which is down 397 feet. The bottom is in porphyry, clay and quartz.

ALPHA.—Southwest crosscut, 600 level, is out 209 feet; face in hard porphyry. No. 3 northeast crosscut, 600 level, is out 12 feet; face in quartz and porphyry.

WARD COMBINATION SHAFT.—East drift on the 1800 level is out 556 feet; face in porphyry.

Columbue District.

LOOKING WELL.—Inyo *Independent*, Sept. 20: Holmes and Mount Diablo mines at Candelaria are reported to be looking first rate. There are large ore bodies in sight in both mines and ore can be taken out faster than the mills at Belleville and Candelaria can work it. Candelaria is reported to be very lively, with fine prospects for the future.

Eureka District.

STARTED UP.—Eureka *Sentinel*, Sept. 20: The Eureka Con. Co. will start up their smelting works to-day. The works have been closed down some two weeks for the purpose of making needed repairs. They have a four months' supply of ore on hand at the present time, and will probably make a continuous run up to next spring.

Pioche District.

CONSOLIDATED.—Pioche *Record*, Sept. 13: The incorporation of the Pioche Consolidated Mining and Reduction Co. is completed, and hereafter the management of all the company's extensive properties will be under one distinct head. The new incorporation is organized under the laws of Utah Territory, and its mines and works are at and near Pioche, Nevada, and include all the various mines and works acquired and constructed by the Pioche Consolidated Mining Co. and the Yuba Mining and Reduction Co., since those two companies began operations here several years ago. The new incorporation consists of 2,000,000 shares, and under the distribution of new stock, each holder of old P. C. stock will receive an equal number of the new shares, while the holders of the Yuba stock will receive for each of the old shares three of the new. This consolidation was effected to secure a more uniform and thorough working of the various properties of the two companies, which are closely dependent upon each other. Among the first steps of the new incorporation will be the reopening and working of the old Meadow Valley No. 5 shaft. This shaft is at about the middle of the old Meadow Valley claim. The No. 5 is a double-compartment shaft and was sunk to the 1200 or water level, but was never used, the company ceasing active operations before the hoisting works and engines were fairly ready for use. The double-acting hoisting engine then placed was considered at the time one of the finest on the coast. It was tested for a few hours only, and stands now ready for use, completely new. At this shaft also, the 14-inch Cornish pump was to be placed to work in conjunction with the present pump at the Raymond shaft. The excavation for the foundation stands ready, and tons upon tons of the necessary pump castings were freighted in and now lie about the works. This was 14 years ago, and now under a new management, the old place is to resume active life. No. 5 will be the shaft through to work the Yuha, Mazeppa and other mines on that ledge; also the Meadow Valley and part of the old Raymond & Ely. A crosscut of 150 feet only will connect the shaft with the Yuha or Mazeppa ledge, along which the company will run until the workings of the Yuba are reached.

Tuecarora District.

NAVAJO.—*Times-Review*, Sept. 19: Stopes on the 150-foot level are looking well and are yielding some very good ore. Stopes on the 250-foot level are without material change. The water is now down to the 450 station.

NEVADA QUEEN.—North drift from North Belle Isle line on 500-foot level, is in 23 feet. The ore has increased in width, showing high grade the entire distance.

DEL MONTE.—First level—North drift has been advanced 10 feet through hard porphyry, water not so strong. Intermediate drift from top of No. 1 joint raise has been started on the line, showing three feet good ore.

NORTH BELLE ISLE.—Stopes on the 150-foot level continue to produce the usual amout of ore. Concentrator was shut down 37 hours for repairs, but is running all right again now.

BELLE ISLE.—No. 1 east crosscut from north drift, 250-foot level, extended 15 feet, face is in low-grade quartz. No. 1 upraise same level extended 7 feet, and a crosscut west from the top of the same extended 9 feet, face in low-grade quartz. West crosscut near same upraise extended two feet; the ground looks favorable.

COMMONWEALTH.—All the stopes look as well as at any time heretofore and yielding full quantity of ore. Hoisted 364 tons during the week. Worked at Union mill, 105 tons Commonwealth ore, battery assay $177.95 per ton. Sent to the concentrator 173 tons. Bullion shipped, $27,934.29; crude bullion on hand, $11,000.

NORTH COMMONWEALTH.—Hoisted 757 cars of ore. Worked at Union mill 61 tons, sent to concentrator 600 cars, worked 433 tons, made 68,000 pounds concentrates. Mill is running on company's ore, doing good work.

Wild Rose District.

CONCENTRATES.—*Silver State*, Sept. 20: The Paradise Valley's Co.'s team arrived yesterday from the mill with 22,000 pounds of concentrates. The

ore which produced the concentrates was mined by men who have leased the Paradise Valley Co.'s mines.

ARIZONA.

AT WORK.—Prescott *Courier*, Sept. 19: Intending purchasers of the Jennings group are busily at work prospecting the principal veins. That they will purchase is said to be almost certain. Frank Carlisle, of the Black Horse mine, returned home recently from the East. Talk is that he will at once start the mine. Prospectors, on Saturday last, exhibited to us encouraging assays of a new find. Assays were made by Mr. Hetherington. There was at the Bank of Arizona, Saturday last, a bar of silver said to have been worth $1500. It was brought to Prescott from the Tuscumbia mill, which is being run by S. G. Mott. Silver was taken out of Prince and Black Warrior ores.

COPPER AT JEROME.—Cor. Prescott *Courier*, Sept. 20: Jerome is a very prosperous mining camp, having enough copper ore in sight to last 50 years. It has a new and improved smelter and employs about 150 men. The camp affords a good market to farmers of the Verde for the sale of their produce. They want a railroad to this camp from Flagstaff, thence by the way of the Black Canyon, touching the Bradshaw mountains, to Phœnix. From Mr. Head, the merchant at Camp Verde, I learn that about ten tons of freight is received at this camp daily, and about the same amount shipped. On the whole, the outlook for the above-named section is very promising.

COLORADO.

MINE LEASING.—Elk Mountain *Pilot*, Sept. 20: Mine leasing seems to be the only solution for the development of the mines in this locality. It is the means by which the mines in the older districts in the northern part of the State were developed. Those who have been in Colorado since the early days will tell you that there was a time when Georgetown, Central, Black Hawk and other camps in Gilpin and Clear Creek counties were almost depopulated. Those who did remain almost gave up hope of ever seeing any mines developed. Miners began to take leases wherever they could, and foot by foot, as it were, the country began to be developed. So it will be in this country. Of the dozen or more mines in this locality that have fallen into the hands of capitalists not more than two or three are being worked, while leasers are getting in on leases wherever they can. The difference between the mine leaser and the mine capitalist is that the leaser is generally poor and has to make at least wages out of the lease, while the capitalist usually has a surplus that is placed at the disposal of some inexperienced person to make extravagant experimental developments. After all this is expended then the owners are ready to quit and pronounce the mine a failure. The owners, being able to live without the benefit of the mine, shut it down and [illegible] for years, a drawback to the country.

DAKOTA.

THE CALEDONIA MINE.—Deadwood *Pioneer*, Sept. 19: Supt. Skinner has put into practice a theory of his own, and aided by Nature, has been successful. The main workings are really comprised in a stope 600 feet from roof to floor without a single timber, the only support being pillars of ore. Were it not for the extreme hardness and tenacity of the ore this could not have been accomplished with safety to the miners; but in the Caledonia, Nature has provided for their safety, and no uneasiness is felt by any as to the caving of the roof 600 feet above them. At the present time the miners, under Foreman Blatchford, are drilling holes for an immense blast to be shot off when the present supply of ore from a blast exploded three weeks since is exhausted. At that time 200 pounds of giant powder was used, but in the one now being prepared 1000 pounds will be used. There are 30 holes of an average depth of 14 feet already drilled. These will be charged, and the shot fired with a battery. Mr. Blatchford estimates that ore sufficient to run the mills for months will be displaced, and past experience tells him that no disastrous results will follow. To stand on the 500-foot level and see that immense stope lighted up with torches at each level, as we did, is indeed a grand sight, one never to be forgotten. Taking the face measurement of all the veins at present being worked, the average width is 125 feet, the average yield about $4, and the average depth so far as has been developed at present about 660 feet. Below the 500-foot level, though, only prospect work has been performed by means of a winze sunk from that level, and crosscuts at the bottom. It is thought to be the only mine in the world to-day where such extensive workings have been performed without timbering.

IDAHO.

THE HIDDEN TREASURE.—Wood River *Times*, Sept. 20: Charles Sherry sent a load of supplies and two men out to the Hidden Treasure mine, in Smoky, to-day, to resume work there. The Hidden Treasure has had considerable work done upon it, and shows a great deal of ore. In the shaft, at a depth of 138 feet, the ore vein is three feet thick; in a tunnel driven 130 feet west of the shaft, there is a thickness of two feet of ore. The chute is therefore at least 160 feet long by 150 feet in depth. The first work to be done will be to connect the tunnel with the shaft for air. Then men will be put to work to stope to the surface. In this way a few men can extract fully 1000 tons of ore by next spring. This ore is low grade, carrying about 70 per cent lead and 30 ounces of silver per ton. Heretofore this ore, after paying all expenses, only left a profit of $15 to $20. But under ruling prices for lead and silver it pays about $30 per ton, and by next spring it may pay as high as $75 per ton.

THE GALORE-STORMY GROUP OF MINES.—The increasing value of lead and silver is causing a resumption of operations on many good properties which have heretofore lain idle. The Galore-Stormy group, in Smoky, is one of these. Frank Massey and John Newkirk left for that property last Monday with supplies, and will immediately lay in enough to last four men all winter. They have taken a contract to connect the lower tunnel (which is already in over 450 feet) with the vein, to then raise to the upper tunnel for air, and to continue the drift in the vein from 250 to 400 feet, according to the character and condition of the vein. The Galore-Stormy has yielded about $60,000, much of this being ore that sold for over $500 per ton, in carload lots.

THE SEVEN DEVILS.—Cor. Salt Lake *Tribune*, Sept. 20: Messrs. N. Treweek and W. H. Remington have just returned from a trip to the Seven Devils country. The country is reached by train to Weiser, thence 105 miles up the Payette, Indian creek, etc., over the divide to the mining region. On the last ten miles of the road the Montana Co. owns the Peacock, and under charge of its agent is improving it to a good stage; so the way to get into the country is plain. Messrs. Treweek and Remington find a primitive community there, who have been long waiting to have an outlet for their ores, although they have not done much work on the ledges. The veins are contact and very wide, the Peacock being the center of an upheaval system extending outward and embracing mines in every direction. The claims are all 600 by 1500 feet in size, and the ore is such as to give validity to the claim of value underground. Every indication proves the great value of the camp. The party from Salt Lake City made a little original exploration, but they found the center of the deposits and bonded (for 30 days at favorable terms) five claims, the North Peacock, Confidence, Steamboat, Walker Placer and Black Garnet, each 600 by 1500 feet. The ore in each, and especially in the Confidence and North Peacock, is of a very lively character, showing high assays. The camp is a copper proposition, the ore going an average of 25 per cent copper, besides the silver and gold. Mr. Kleinschmidt of Helena, Montana, went in there four years ago and took the Peacock claim for the central ledge. He has been shipping rich ore from there ever since. The North Peacock, Confidence, Steamboat, Walker Placer and Black Garnet were bonded for 30 days by the Salt Lakers, and the samples of ore shown are very favorable. Mr. Treweek says he will put a shaft down 200 feet on the Confidence, and will push development as needed without shipping any ore. A Boston company with plenty of capital has the South Peacock and other claims that show well. It is altogether a fine showing.

LOWER CALIFORNIA.

CEDROS ISLAND.—*Lower Californian*, Sept. 20: The Pacheco arrived yesterday from Cedros with 123 tons of ore from the mines. It is reported that 62 men are now employed at the two camps. The buildings owned by the Mining Company, including a neat office at the lower camp near the steamer landing, have been nicely painted and the camp presents a better appearance than ever before. The men at work in the tunnel have struck the vein at 349 feet, and the ore is said to be fully as good as that nearer the surface.

MONTANA.

CARDWELL DISTRICT.—Boulder *Age*, Sept. 19: A. H. Hadley recently shipped from some of his mines in the Cardwell district to Butte, 8 tons of ore, and these returned him $2100. He has some very promising prospects in the district. J. C. Sloss was in town Saturday and reports preparatory work going on for the development of the properties in the Cardwell district recently bonded by him. He has also shipped a couple of cars of ore to Butte, but the returns from them have not yet been received. Uncle Ben Mason has sold to John G. Howard and brother the Latrobe mine, over the Montana Central tunnel, for $3000, and has bonded the Virginia Belle and its extensions to the same gentlemen for $14,500, the bond to run 16 months. The Howard brothers will immediately proceed to the full development of these very promising properties.

THE ALICE.—*Inter-Mountain*, Sept. 20: The Alice mill and the mines of that company are being run to their full capacity. This gives employment to a large number of men and they in turn give life and vigor to the town of Walkerville. The Alice mine continues to be developed on the 1100, 1200 and 1300 foot levels and reports from all of these are of a very favorable character. The Blue Wing is taking out its regular quantity of ore and the Magna Charta continues to be the stand-by of the company, ore being taken from all its levels to the 600.

THE MOULTON.—The mill of the Moulton Co. has been temporarily shut down pending the rebuilding of its stack, which was demolished by the runaway engine on the Montana Union last Sunday night. The mine is working its regular force and doing all the necessary work making ready to push the abstraction of ore as soon as the stack is completed, which will take at least 20 days. This is the only mill of any importance in the whole camp that is in a state of idleness at the present time.

BUTTE & BOSTON.—The depth of 700 feet has been reached in the West Gray Rock and sinking continues below the 600 in the east shaft. The East Silver Bow is down 500 and the whole of the mining property of the Butte & Boston is in excellent shape, with bright prospects for the future. The huge machinery for the new concentrator is fast arriving and being placed in position. When this plant is completed it will be the largest in the county.

THE BLUE BIRD.—This company is adding miners from day to day and it is expected that the machinery of the big mill will commence Monday on ore. Every preparation is being made and it is thought they may be completed by that time. The change will not be without its effect upon Butte as well, for it will mean employment for nearly 500 men and a monthly output of bullion that will be far more valuable now than ever, owing to the advance in the price of the white metal.

NEW MEXICO.

LAKE VALLEY MILL.—Silver City *Enterprise*, Sept. 20: John M. Wright and C. H. Wilkie returned this week from Lake Valley, having inspected and purchased the Lake Valley mill. The plant will be removed immediately to the Last Chance mine in the Mogollons. The crushers will give way to 20 stamps and the mill otherwise adapted to the treatment of the Mogollon ores. The Good Luck mine at Lone Mountain continues to grow richer and the ore body more extensive with development. Last Friday another car of very rich ore was shipped to Denver.

BIG PROFIT IN LEAD ORE.—Last week H. J. Hutchinson of Central returned from Socorro, where he had taken a carload of 19¼ tons of lead ore. The ore averaged 55 per cent and 8¾ ounces silver per ton. Gross returns, $744.95; freight, $56.42; net returns, $688.53. This shows what may be done with our lead mines even though low in silver.

PYRAMID.—The Humboldt Co. of Shakespeare are now figuring on a new process for working their ore, and if it is demonstrated that it can be made a success, they propose to revolutionize the mining industry in that thriving hamlet.

HACHITA.—Hachita camp is quite lively. There are about 25 men at work in and about this camp. The American mine is working about 14 men and could work as many more if they had teams to take the ore out of the way; the dumps are full of good ore. The Hornet is working every day with good results.

OREGON.

CINNABAR.—Jacksonville *Times*, Sept. 20: The work of reopening the cinnabar mines on Wagner creek goes on gradually but surely. Philip Mullen, who is prospecting a promising ledge on the Siskiyou side of the mountains, is making a favorable showing. Root & Boswell, who bonded Dr. Braden's mines near Gold Hill, have a large force of men at work and are realizing five ounces and upward a day. From the Mountain Lion mine in Josephine county a good quality of ore has been taken for some time past, and a quartz-mill will soon prove its richness. Lack of water has compelled Henry & Messenger on Horse creek to suspend their arastra for a time, and they are now at work on their shaft and tunnels. Logg, McDonell & Atterberry of Forest Creek have finished a ditch that covers some excellent mining ground, and will furnish them a liberal supply of water. Ennis & Cameron are building a large reservoir at their Galice creek mines and making general preparations for the winter. They will be able to commence piping as soon as the reservoir is finished. The Waldo copper mines in Josephine county have been bonded by a party of San Francisco capitalists. The assays on this mine from four different samples average 40½ per cent. Some work has already been done, consisting of one tunnel 70 feet in length and a shaft of 50 feet, which shows a large amount of rich-looking ore.

THE CINNABAR MINES. — Ashland *Tidings*, Sept. 13: Large bodies of rich cinnabar ore in the Siskiyou mountains southwest of Ashland and Wagner buttes attracted the attention of prospectors years ago, and considerable quicksilver has been taken out of mines there. Messrs. Henry Klippel and M. Caton, of Jacksonville, operated the Emmeline cinnabar mine there some years ago, and took out some ten tons, but having no facilities for working the ore to good advantage, they suspended operations. Recently Mr. McGee went out to examine the property of the Emmeline Cinnabar Mining Co., and was so much pleased with the character of the ore and the good prospects generally that he and Francis Fitch, of Medford, have bonded the mines for a year, and are now employing a number of men in running tunnels, sinking a shaft, ground-sluicing and other prospect work. The prospects are reported to be satisfactory, and it is believed that the work of obtaining the quicksilver from the ore will be commenced before winter with such means as may be possible for temporary operations. The operations of these mines upon a large scale would be of vast benefit to Jackson.

UTAH.

A NEW SMELTER.—Salt Lake *Tribune*, Sept. 19: There are strong rumors that a still stronger combination is preparing to build a new smelter near Salt Lake that will secure ore producers better prices for their ores; prices corresponding to the recent reduction in ore rates made by the Union Pacific to Salt Lake City. The principal complaint at present seems to be that while freight reductions from the north are nearly 100 per cent under former charges there are no indications that the cost of smelting will be reduced. A lower scale of charges must be reached to make this point what it should be in case the smelters refuse to make any reduction. It is possible that a combination of the ore producers and local capitalists will unite with Eastern capitalists in erecting a great smelter, capable of handling the ores of Utah, Nevada, Idaho and Southern Montana. The need of a great smelter is further evidenced by the fact that at least three railroad lines are preparing to start for salt water within twelve months, from Salt Lake City, and just as soon as they reach Nevada the ores will begin to pour into Salt Lake.

BULLION RECEIPTS.—The receipts of the minerals in this city for the week ending the 17th instant, inclusive, were to the total value of $218,423, of which $123,628 was in ore and $94,825 was in bullion. For the previous week the receipts were valued at $327,921, of which $248,420 was in ore and $79,501 was in bullion. The product of the Ontario for the week was of bullion, 22,152.54 silver ounces; in ore sales (three lots, 12th, 15th, 16th), $23,780.20, an approximate total of $45,932.74. The Daly yield for the week was in sulphides sold, 75,087.37 ounces silver; 59,508 ounces gold; realized $84,954.54. The Horn Silver election was held on Tuesday last, and resulted in the continuation of the management that has controlled the past year. Bullion receipts in this city for the week were valued at $32,200; gold dust, $800; gold bar, $900; silver bars, $14,000; selected lead, $1175. The Hanauer smelter produced during the week bullion valued at $45,750. Ore receipts in this city for the week were to the value of $55,206 by Wells, Fargo & Co.; $60,217 by McCornick & Co.; and $8205 by T. R. Jones & Co.

WASHINGTON.

THE SMELTER.—Tacoma *Ledger*, Sept. 16: Fire was started yesterday morning in the crucibles of the first stack to be at the works of the Tacoma Smelting and Refining Co. Forty-eight hours will be required to get the crucible in shape for the ore, and then the blowing-in process will be complete. The fire thus started will be kept burning for an indefinite length of time. Once started the fires must be kept up, with shut-downs for repairs only, or to secure an additional supply of ore; but the Tacoma smelter has ore enough on hand already to keep several stacks going for a long time. Additional consignments are coming in daily from all parts of the country. In the course of a month or six weeks another stack will be started. Each stack will smelt 50 tons of ore daily. The capacity of the smelter will be increased as occasion demands. The roasting furnaces were started a couple of weeks ago and have been running steadily ever since. Fifty men are employed at present in the works.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 16, 1890.

436,623.—APPARATUS FOR MAKING EXTRACTS—Geo. S. Andres, S. F.

436,624.—APPARATUS FOR MAKING EXTRACTS—Geo. S. Andres, S. F.

436,556.—HARNESS LOOP—A. W. Bennett, Portland, Ogn.

436,594.—WAGON JACK—A. T. & A. W. Brann, Dayton, Nev.

436,699.—ROTARY VALVE—P. N. Dellinger, Whatcom, Wash.

436,653.—SUSPENDER CATCH—J. O. Folsom, Canyon City, Ogn.

436,629.—FRUIT PITTER—J. T. Ish, S. F.

436,481.—KITCHEN CABINET—B. H. James, No. Yakima, Wash.

436,459.—LATHE CHUCK—F. McClure, Stockton, Cal.

436,610.—RUNNING GEAR—S. McGarvin, San Jose, Cal.

436,741.—HAY RICKER—D. F. Oliver, S. F.

436,634.—FENCE POST—H. A. Peabody, Ukiah, Cal.

436,642.—DESK—C. B. Towle, Vallejo, Cal.

436,643.—ANIMAL TRAP—White & Murphy, Pomona, Cal.

The following brief list by telegraph, for Sept. 23, will appear more complete on receipt of mail advices:

California—Daniel Best, Sao Leandro, traction engine; Daniel Best, San Leandro, injector; Daniel Best, Sao Leandro, boiler; John Dihrberg, Visalia, water-closet indicator; John W. Eisenhuth, assignor to Electric Vapor Engine Company, San Francisco, explosive engine; Silas Harris, San Francisco, axle machine; John F. Kirby, San Francisco, governor; Nicholas Kramer, Sacramento, car-coupling; John A. Rueger, Sao Francisco, block puzzle; Thomas Scheen, St. Helena, lawn-sprinkler; Andrew T. Sherwood, San Francisco, uterine supporter; Wm. Shipley, San Luis Obispo, door check; Matthew S. Tarkington, Tulare, wire fence stay; Auguste Wagoiere, Los Angeles, electric arc lamp; John H. Watson, Selma, hame hook; Hugh Wilson, Duncan's Mills, lifting-jack. Oregon—John B. Kelly, Pleasant Home, pneumatic railway; William A. Miller, Wapinitala, circular saw; Zatique Penard, Portland, sash-fastener. Washington—Jasper Howe, Tacoma, shipping-receipt books; William W. Shearer, Port Angeles, wire-drawing drum.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

APPARATUS FOR MAKING EXTRACTS.—George S. Andres, S. F. No. 436,623. Dated Sept. 16, 1890. This is an apparatus for extracting from animal and vegetable fibers the fatty acids, oils and other soluble matter which may be contained in said fiber, all of which constituents are soluble in water or more volatile solvents, such as some of the hydrocarbons, bisulphide of carbon, alcohol, ether, etc. The object of this invention is to provide an apparatus of simple construction by means of which extracts may be obtained from animal or vegetable fiber, either in a continuous or intermittent manner, and which may be also employed for more perfectly removing dirt and other soluble matter from the fiber.

APPARATUS FOR MAKING EXTRACTS.—George S. Andres, S. F. No. 436,624. Dated Sept. 16, 1890. The object of this invention is to provide an apparatus of simple construction, by means of which extracts may be obtained either in a continuous or intermittent manner and which may also be employed for more perfectly removing the solvent from the extract either with or without pressure.

SCHOOL DESK.—Charles B. Towle, Vallejo, Solano Co. No. 436,642. Dated Sept. 16, 1890. This is one of that class of school desks which are provided with a sliding or adjustable top, a vertically adjustable seat and a vertically adjustable foot-rest. The invention consists in the novel arrangement relating to these several parts.

ANIMAL TRAP.—Frank White and Frank J. Murphy, Pomona, assignor of two-thirds to said White and one-third to said Murphy. No. 436,643. Dated Sept. 16, 1890. This is one of that class of animal traps designed for catching moles, gophers, etc., and in which opposing spring-controlled jaws are held separated by a suitable trigger which, upon being tripped, allows the jaws to close. The object of this invention is to provide a simple and effective trap of this class having jaws at both ends by which it is adapted to catch the animal coming from either direction.

FRUIT-PITTING MACHINE.—James T. Ish, S. F. No. 436,629. Dated Sept. 16, 1890. The fruit is placed in suitable cups, and as each cup of the series moves forward, the holders are opened and projected toward it, passing on each side. Then they come together on the front and carry it backwardly into position between knives which at this time have separated. Then the knives come together so that their cutting edges divide the fruit, while the points engage the pit of the fruit. When the knives have closed down on the fruit and cut its flesh from the pit, they then separate laterally, so that the points give the pit a kind of twist, while the knives themselves separate the flesh from the pit, and as the knives open again and the holders separate, the fruit is released and falls into a suitable receptacle below.

MECHANICAL PROGRESS

THE WASTE OF EXHAUST STEAM. — The amount of heat that is wasted in the steam that passes out of the exhaust pipe is very much greater than is commonly believed; for every pound of steam allowed to escape into the atmosphere carries with it at least 934 heat units that have been taken from the fuel. The amount lost in this way is a very large per cent of the total heat units abstracted from the fuel and is many times greater than the amount used in doing useful work. By utilizing the exhaust steam for heating purposes the gain will be found to be much greater than the loss from the back pressure necessary to force the steam through the heating coils. When the exhaust is used for heating the feedwater, considerable of this heat is utilized, but as all of it cannot be employed for this purpose there is still considerable of a loss, for every cubic foot of the steam that escapes carries with it 31.75 heat units that might be utilized before the steam would be condensed into water at a temperature of 212°. In multiple-expansion engines considerable more heat is utilized than if the same amount of steam had been used in a simple engine, as the only way in which the heat of the exhaust steam can be utilized is by a transfer of the heat to some body colder than itself. When these facts are fully understood and appreciated, considerable economy may be obtained from the heat of the exhaust steam, permitting only water to escape.—*Stationary Engineer.*

ANOTHER FORM OF COMPOUND LOCOMOTIVE. Mr. Mallett of Paris has recently patented a new arrangement of cylinders for compound locomotives. There is one high and one low-pressure cylinder placed tandem in the center of the engine under the smoke-box. The forward of the two is the high-pressure cylinder. The low-pressure cylinder connects by the usual piston cross-head and main-rod to the rear axle, which has an inside crank. The high-pressure cylinder has its piston extending forward to a cross-head, or more properly, a cross-bar, which connects with crank-pins upon the outside of the forward pair of wheels by means of outside rods. This arrangement makes a cross-head under the front bumper which receives the piston-rod at the middle of its length, and has bearings outside of the frames for the rods. The cross-heads would, therefore, probably be somewhere about 70 inches from center to center of the main-rod bearings. The two parts of driving-wheels are connected by parallel rods, and the relative positions of the two sets of main-rod pins are thus kept 90 degrees from each other. The parallel rods are not placed opposite either main-pin, but half-way between, so that the parallel rod-pins make an angle of 45 degrees with each main-pin.

ADVANCE IN AMERICAN STEEL-MAKING.—The *Iron Age* states that, since the policy was adopted of using none but domestic steel in all the new ships in the American navy, there has been a great advance in the art of making and working steel in the United States. When that policy was first adopted, on an average less than 70 per cent of the output of the various mills was able to pass the naval inspection. With increased experience has come the ability to do much better work, and Commodore Sicard, president of the Naval Board of Steel Inspection, states that more than 90 per cent of the steel will now pass the most rigid inspection. The capacity of the steel-mills of the country has greatly increased in the mean time, and a still further increase is to be made by the Bethlehem Iron Works, where the erection of the most complete plate rolling-mill in the United States is under way. This mill is to be capable of turning out all kinds of sections and angles, as well as plates of all thicknesses up to six inches. The armor-plate plant erected by the Bethlehem Company is about ready to begin operations. A few experimental plates have been forged already, but none intended for use in the construction of a vessel.

IMPROVEMENT IN SAND-MOLDING PROCESSES. A company is being started in Glasgow, Scotland, for the purpose of manufacturing improved sand-molding machines, as patented and already introduced, on a limited scale, by Mr. Leeder, foreman molder of the Singer Manufacturing Co.'s works at Kilbowie. By the employment of Mr. Leeder's invention a great saving is effected through dispensing with the use of molding-boxes, the maintenance of which is a considerable item in the working expenses of a large foundry. Over 40 of the patented machines are at present in operation in the foundry of the Singer Manufacturing Co., and it has been found on the average that by their means the cost of producing molds for the castings has been reduced to about one-fourth of what had been formerly incurred, and that in an establishment where every appliance of value has been available for the ordinary process of molding.

THE HIRSH ALUMINUM PROCESS, to which this and other technical journals have given wide circulation, seems more latterly to have proven a first-class fraud. It will be remembered that the professor claimed that he could make aluminum from Chicago clay at a cost of 15 cents a pound. The project is now thought to be simply a scheme to secretly purchase the aluminum and make it up for sale in manufactured articles, thus keeping up enough semblance of a genuine business to draw in a host of confiding investors. The popular interest in aluminum is so great at the present time that the field for the perpetration of such a fraud is very inviting.

IN COMPETITION.—There are now two American-built locomotives running on the Tokio-Kioto railroad in Japan in competition with two similar English locomotives, all doing the same class of work on a mountain grade of 132 feet per mile for ten miles of the distance. The American machines are of the Baldwin make; the English from the shops of Naemyth, Wilson & Co. They are running in competition to prove their respective merits. The result of the trial will determine whether England or the United States is to furnish Japan with locomotives in the future, that is, if Japan doesn't construct them for herself. Even in that case, it will be interesting to learn which type will win in the choice of that Oriental people.

BEST MATERIAL FOR LOCOMOTIVE CRANK-PINS.—The *Northwestern Railroader* recently sent out a circular asking for expressions of opinion as to the best material for locomotive crank-pins. Answers were received from 120 members of the Master Mechanics' and Master Car Builders' Associations—being a larger expression of opinion than is ever obtainable at the annual convention of either association. Among those who replied were a majority of the best known heads of mechanical departments in the country. On the subject of locomotive crank-pins, opinion was fairly equally divided between iron and steel, with an advantage in favor of the latter of 44 votes to 34.

BASIC LINING FOR BESSEMER CONVERTERS. The Pottstown Iron Company of Pottstown, Pa., has acquired the patent for the United States for the basic lining for Bessemer converters, invented by Ernest Bertrand of Kladno, Bohemia. The method is somewhat similar to what has been done with acid lining, viz., to grind the material, dolomite or limestone, mix it with water, with or without an adhesive substance, like molasses, and form it into bricks. The latter are burned at a white heat for about 48 hours in a kiln. These burned bricks are again ground and mixed with 10 to 12 per cent of tar, the product being used to ram up in the converter.

LINING CYLINDERS.—Mr. Foster of the Fall Brook Coal Company, has a method of lining cylinders that practically makes a new cylinder for $25. When the cylinder is bored out for the last time, instead of working it in that condition, a cast-iron lining ¾ inch thick is slipped in. The lining strikes the edge of the bore at the back port and thus forms a counterbore. The front end is held by the front head and has the port cut out of it, so that no fastening is required. This makes the diameter of the cylinder 1½ inches smaller than the last boring, and about ¾-inch smaller than the original size.—*National Locomotive Builder.*

ALLOY OF ALUMINUM AND TIN.—M. Bourbouze has compounded a very useful alloy of aluminum and tin, by fusing together 100 parts of the former with 10 parts of the latter. This alloy is paler than aluminum, and has a specific gravity of 2.85, that is, it is a little heavier than the pure metal, but not too heavy to be formed into parts of instruments intended to be very light. The alloy is not as easily attacked by the several reagents as aluminum is, and it can also be worked more readily. Another great advantage is that it can be soldered as easily as bronze, without further preliminary preparations.

CRUSHED STEEL is said to be coming into use for cutting stone. It appears to be made by quenching very high carbon steel in cold water from an excessively high temperature, such as would overheat steel for most purposes. This renders it not only hard but rather brittle, so that it is possible to pulverize it; it is brushed in a stamp-mill and sifted closely to size. It is said to be not only cheaper but much more effective than emery, giving a better polish and quicker, and lasting much longer.

CARE OF BOILERS.—There are many little places about a boiler that escape thorough inspection, even though the more exposed places are well looked after. These will give trouble some day. Boilers, where the top is covered over and the gases return over the top of the boiler, are apt to be neglected here, and in a short while will become well covered with soot. In this way any benefit that may have been derived by the return of the gases is practically lost.

EXPERIMENTS made in Sweden by M. Sandberg on the strength of iron rails during winter have shown that steel rails containing over 4 per cent of carbon are apt to break in cold weather. In fact, the result of his investigations points to the use of rails having less carbon than this—say 3 per cent—in countries as cold in winter as Norway and Sweden.

LONG-DISTANCE POWER.—One of the features of an electrical exhibition at Frankfort, Germany, is to be the transmission of power (500 horse) a distance of 140 miles. It is not pretended that this can be done economically, but the mere doing of it will be one of the wonders of the exhibition.

SCIENTIFIC PROGRESS.

The Philosophy of Quicksands.

Nearly every engineer has, at some period in his working, been puzzled to determine the best way of dealing with quicksands; hence the subject-matter of a paper on such sands, presented by Mr. Wilfrid Airy to the British Institution of Civil Engineers, will likely prove of interest. The author explained that articles great and small, which would be perfectly well able to float in water, are unable to do so in a quicksand, although the sand is of greater specific gravity than water, and are gradually drawn down. Vessels which have been stranded on quicksands by a falling tide have been unable to float off when the tide has again risen, and after being swamped have settled down deeply into the sand; and in the descriptive accounts of such accidents it is often stated that there appeared to be something mysterious in the way the vessels disappeared.

When a vessel or other body floats in water, it floats by virtue of the vertical components of the water pressures around it. If, for instance, the body be a rectangular box floating with its sides vertical, then the box floats solely by reason of the water pressure on its bottom, and if its bottom were protected in any way from the action of the water, the box would not float. This is precisely what happens in the case of a quicksand. The mingled mass of water, silt and sand which constitutes a quicksand forms a semi fluid which is not capable of transmitting the full hydraulic pressure of the water. When, therefore, a vessel comes upon such a quicksand, her bottom is partially protected from the action of the water, and she is unable for a time to float up, even after the water has risen considerably higher than the ordinary flotation level of the vessel. Sooner or later she will float up if she be not swamped.

A quicksand may be defined as a mass consisting chiefly of sand, but partially also of silt or argillaceous matter so intimately mixed with water that it forms a semi-fluid, having all the properties of a fluid, but in a minor degree. The most familiar instance of a quicksand is that of the sand on a beach, where it is kept alive and mixed up with water, soil and organic matter by the action of land springs rising from below it. This often forms a very dangerous quicksand. But the admixture with water may be due to other causes. In general, the tendency of silty sand is to sink together and form a firm, compact body, having apparently none of the properties of a quicksand; but this very sand, when its surface is disturbed by mechanical violence, such as the force of the waves, will, to a certain depth, become a quicksand. The grains of sand become so intimately mixed up with the water that the mingled mass of sand, silt and water becomes a semi-fluid covering the solid body of the sand to a certain depth.

It will be readily seen that the extent to which a mass of sand is capable of becoming a quicksand will depend upon the fineness of the sand and the extent to which it is mixed with silt or argillaceous matter. If the sand be sharp and clean, no matter whether it be coarse or fine, it has very little of the nature of a quicksand; but if it be in a fine state of division and be mixed with silt, etc., the particles will be readily held in suspension by the water, and it may form a deep quicksand. If a vessel be left upon such a quicksand by the falling tide, it will sink considerably into it and the sand will form a very complete and sufficient seal around the bottom; and on the subsequent rise of the tide the vessel will not float when the water has reached the ordinary flotation level, but a considerable time will elapse before the water can communicate sufficient of its pressure through the seal of sand to float the vessel, and in the mean time the water will have risen considerably higher than the ordinary flotation level of the vessel.

In order to verify the conclusions, and to obtain some reliable measurement of the effect of such quicksands, Mr. Airy made many experiments with different kinds of sand, both fine and coarse, with the general result that clean and sharp sands had few of the properties of quicksand. But the case was different with sands which, although apparently clean, contained an admixture of clayey matter. The experiments all show that there exists in fine sand, with a slight admixture of clayey matter, a capacity for becoming "quick" and holding vessels to a degree which, in combination with other causes, may act powerfully in bringing about some of the terrible and unexplained shipwrecks that so frequently occur on sand-banks. If in any case it should be thought advisable to make provision for freeing ships from sand-banks which they might be liable to run upon, the plan to be pursued is tolerably clear. All that is wanted is to assist the external water in breaking through the seal of the sand round the bottom, and re-establishing the full hydraulic pressure. This could be done by forcing water with pumps through holes in the ship's bottom, and would probably soon have the desired effect.

THE ENGLISH LANGUAGE FAST BECOMING UNIVERSAL.—*Kuhlow's German Trade Review*, a leading German periodical, but which is largely read by business and literary men throughout the world, and which is published at Berlin, the capital of the German Empire, is printed in English. A late number of that journal, after referring to the great number of persons who speak various languages in Europe, sums up by saying: "The English language is now used by nearly twice as many people as any of the others, and this relative growth is almost sure to continue. This is the reason of *Kuhlow's* appearing in the language of the trans-Atlantic world—English." Forty or fifty years ago we heard it prophesied that the universal language of the world would eventually be the Anglo-Saxon, and we now believe it more firmly than ever.

Loss of Heat in Chimneys.

There are many common errors as to the chimney temperature, one of which is that a high temperature therein argues a considerable loss of heat from the furnaces, but this does not by any means necessarily follow, for if the combustion of the fires is imperfect a large proportion of the gases pass away unconsumed, with the effect of lowering the funnel temperature; but on the other hand, when the gases become thoroughly consumed, a much larger amount of heat is generated, and though the chimney temperature may be higher, yet a very much larger relative proportion of heat gets into the boiler to perform useful work. The temperature in a furnace in which incomplete combustion is taking place—that is, in which a proportion of the gases passes away in the form of carbonic oxide—may be, say 2000° F., and the chimney temperature 500°. If the combustion is then completed, and the carbonic oxide instead of escaping becomes converted into carbonic acid, the furnace temperature may rise to 3000° F., and that of the chimney to 800° F.

Chimney Gases.

The Research Committee on marine engine trials have recently issued tables giving an analysis of chimney gases, which show them to consist (approximately) of

Carbonic acid	10
Oxygen	10
Nitrogen	80
Total	100

While their temperature varied from 500° F. to 800° F.; and as the whole of this heat passed away through the chimney, it was entirely lost. An American writer has remarked: "The time is approaching when tall chimneys will serve no more useful purpose than that of monumeots to the folly of their builders."—*Chicago Journal of Com.*

FLAMELESS COMBUSTION.—In [illegible] on "Flameless Combustion," Mr. T. Fletcher said: The appearance of flame is misleading, and the greater the flame the smaller the work done, other things being equal. I have been asked by a well-known engineer if I could explain why certain boilers gave such exceedingly small duty for the fuel consumed, when the flues were, as he said, "filled from end to end with magnificent flame." The fact was that his so-called magnificent flame was a delusion, hollow and cold inside, and not coming in contact with his boiler at all. When the same fuel was burned with a very small flame, hardly visible over the bridge, the duty increased some 30 per cent.

HEATING AND COOLING BY THE SAME FURNACE.—"The time is coming, and it is near at hand," says the Commissioner of Patents, "when our homes will be made cool by the very same furnaces which warm us in winter. As a matter of fact, there are plans and specifications already in this office which scientists have been engaged upon for some time past and have nearly perfected, that make it possible for every one who can afford to own a furnace to make, if he chooses, his house as cool as an ice vault. When this invention is thoroughly perfect, heated terms will have no terrors for those who have the means to use it."

THE REASON WHY the electric light is not as efficient in piercing fog as the yellow gas or oil light is that fog is blue, by reason of which the electric light intensifies rather than pierces it. To remedy this, experiments which promise the fullest success are now being made to introduce hydrocarbon vapor into the arc, which changes the white color of the arc to one of more or less deep yellow, according to the quantity of hydrocarbon consumed.

MAGNETIC QUALITY OF THE ELECTRIC LIGHT. An attempt has lately been made in the United States Navy to light the binnacles of ships by electricity instead of oil; but it was found that by bringing an incandescent lamp close to the compass a deflection of the needles could be produced.

TWO NEW ASTEROIDS.—Director Holden of the Lick Observatory informs the San Jose *Herald* of the discovery at the observatories at Nice, by Astronomer Charlois, of two asteroids on the 9th inst. They are respectively of the 12th and 13th magnitudes.

A PRETTY EXPERIMENT —If you have a chain made of alternate links of platinum and silver, and pass a strong electric current through it, the platinum links become red hot while the silver remains comparatively cool.

THE APPLICATION OF ELECTRICITY to all sorts of extensive enterprises reveals its readiness of operation, as well as its capability for usefulness in a superlative degree in almost every department of industry.

Useful Information.

Railway Employes in the United States and in England.

There have been many and varying estimates as to the number of persons employed in the railway service in the United States, and some of them have been very wide of the mark; Poor's Manual, for instance, in 1889 estimating the number at more than 936,000, or an average of six persons per mile. The census of 1880 made the average 4 8 men to the mile, and from an examination of the various State railroad reports and numerous company reports the *Railway Age* some years later came to the conclusion that the railway employes in this country average in number about five to the mile, an estimate which is pretty well supported by a table by the statistician of the Interstate Commerce Commission, just published, showing the number of employes by classes. From this it appears that the average at the date of report, June 30, 1889, was 4.59 per mile of road, and that the number of workers aggregated 704,743. To this estimate it is added that "the railway industry of the United States provides a living for 3,000,000 persons, or about one in 22 of the total population of the country," this of course not including railway stockholders, who in many cases obtain their support largely from the earnings of the roads.

The document quoted from proceeds to compare the number of employes on American and on English railways, showing a very much greater number of men to the mile on English roads than on ours; a fact which seems to furnish some presumptive evidence of the superior efficiency of American railway men, although the vastly greater traffic to the mile on English roads than on our own must be considered in making a just estimate. English railways in 1888 employed 346,426 men on 19,820 miles of railway, or 1748 men per 100 miles of lines; that is, nearly four times as many to the mile as on our roads. The fact that while with eight times as many miles of main line our railways employ only 2½ times as many engine-drivers as those of Great Britain is of itself an indication that the traffic of English lines is so much greater per mile than that of ours as to prevent satisfactory comparison from the data here given. The very rapid construction of railways in thinly settled portions of this country has reduced the average number of men employed per mile, but the tendency is constantly toward an increase of the average working force as a result of the increase of traffic on new and old lines also, so that at the present time five men per mile of road is probably not far from a correct basis for estimate; and as the railway mileage of the United States is fully 164,000 miles, we may say that in round numbers the railway employes of the United States now aggregate about 800,000 persons.

Cutting Glass Bottles.—A correspondent of the *Scientific American* gives the following as the method by which glass bottles may be cut off smooth and square: "Fasten the bottom of the bottle to a chuck on a wood lathe with melted resin, and then revolve the lathe at a high rate of speed. It can be cut as true as a straight edge by holding a piece of thin, soft iron wire on the spot where it is desired to cut it off, keeping it there till the wire gets red hot, then project a little water on the hottest part of the wire, when the neck will fly off. This is the best way it can be done, and is the way French ware is cut off in glass factories, only the chuck is hollow. If the bottle to be cut is thicker in one place than another, the cut may not be quite as true." Another correspondent gives a method which might be used when a lathe is not at hand. "Cut carefully clear around with an ordinary glass cutter, then place the bottle on a microscope turntable, or on any apparatus that would allow it to turn steadily and smoothly (suspending by a cord from ceiling might do), then revolving it at a speed of from 50 to 75 revolutions per minute, and directing the flame of a blowpipe on the mark made by the glass cutter; in a half to two minutes the bottle will crack the greater part of the way round, when the blowpipe can be removed, and by gentle traction upon the two parts, they will separate very readily; if not, a wet string laid on the mark will usually complete the operation. The main thing is to heat the glass evenly clear round."

The Big Lens.—A dispatch from Cambridge, Mass., dated Sept. 18th, says: Yesterday the glass for the University of Southern California telescope was unpacked by Alvin G. Clark. Among those present were Judge R. M. Widney, president of the University Bank of Los Angeles and a trustee of the University of Southern California, George Clark and Robert Widney. When the lid of the big box was removed, Clark tenderly lifted away the excelsior fiber which covered the precious lens. The glass measures about 10 feet in circumference, or 4 feet 4 inches in diameter. Although it is 2½ inches thick at the center and 1½ inches at the edge, it was as transparent as a bit of thin plate glass. Clark's hands fondled it as he would a baby while he murmured: "What a beauty it is. No one ever saw its like before." It is nearly five inches wider in diameter than the Lick telescope glass. Clark says that its curve on one side is almost perfect, as he ascertained by the aid of a spheroid, but that the other will stand a great deal of cutting down. He has not yet decided whether he will have the work done at his manufactory in Cambridgeport or put up a new plant to complete it near the scene of its future home in California.

A Smoke-Consuming Apparatus has been adopted by the corporation of Leeds, in connection with two boilers for the public refuse destructors. The chief feature of this new apparatus is that the furnace is so constructed as to burn in a downward direction. Ordinary fire-bars are not used. By a descending draught the smoke, thoroughly saturated with oxygen, is passed through the mass of incandescent flame, the hydrocarbon gas being thereby burnt and destroyed, and the flame converted into carbonic acid gas before it enters the flue.

Good Health.

Health of the State.

By the report of the State Board of Health for August it appears that reports were received from 96 localities with an estimated population of 808,360, among which were 1065 deaths, an annual average of 15 84 per thousand, somewhat less than the report for the preceding month.

Among the principal causes of death, the greatest number, 157, were from consumption, an increase from last report.

Cholera Infantum is reported to have been the cause of 76 deaths; this large percentage has been due to the average high temperature during the month.

Heart disease appears to be increasing; 63 deaths are attributed to this cause.

Pneumonia has claimed 41 deaths; a decrease of 10 since last month.

Bronchitis is credited with 29 deaths, 20 of which were in this city, over two-thirds of the whole number, although its population is but a small fraction short of one-third of the whole population reported upon.

A Fatal Neglect.

Under the head of diphtheria, a circumstance is recorded to which general attention should be called as a warning against similar neglect in the future, and as an evidence of the manner in which that dreadful scourge (diphtheria) is sometimes induced. We copy as follows from the report: From the latter city (Alameda) Dr. J. T. McLean reports 18 cases of diphtheria, nearly all of whom were attending one of the public schools. He says: "An old cement sewer laid 12 years ago in the block on which this public school is situated, wore out and caved in, thus stopping the flow of sewage from the residences and school in this block. The old sewer was taken up and replaced by a new ironstone one. The process of change from the old to the new sewer occupied a fortnight. During this time, sewer gas and disease germs escaped and contaminated the atmosphere in the neighborhood. The school children were more or less exposed, especially those whose curiosity drew them frequently and for a length of time to the vicinity of the sewer. The disease developed in these children, and it is believed this broken sewer, with its escaping gas and disease germs, was the exciting cause of this sickness. In one family, where three children had diphtheria, one of them dying, the plumbing and sewage were defective, the filth that should go into the sewer escaping into the cellar and contaminating the atmosphere of the house, from which the sickness and death in this family resulted. Other cases of the disease are of a mild type."

Milk Instead of Medicine.—Leading physicians are becoming holder. Many have courage now to prescribe a certain diet instead of drugs. Is not the food an important factor in determining the character of our future lives? The infant whose mother drinks alcoholic stimulants while nursing it, will, three chances out of five, be addicted to the use of such stimulants when grown. A weary business man comes home from his office at night nervous and out of temper. A glass of milk heated to about 90 degrees, sipped a little at a time, and no food taken with it, or at most only a little bread and butter, will do more toward restoring him to a happy mind and good physical condition than all the tempting viands that can be placed before him. A lady in Platte county, Mo., was pronounced incurable. A well-known physician in Kansas City advised her to give up all medicine, and, in order to prolong her life, prescribed three ounces a day of a mixture of sweet cream and sponge cake. Inside of four months she was well.—*Ex.*

Remedy for Cholera.—It is said that a remedy for cholera has been discovered by a Frenchman from Cette. People either attacked by or in fear of the disease must sit for some hours in a garment soaked in paraffine, which irritates the skin, producing a healthy reaction, and kills the cholera microbe. How can such a remedy act upon the cholera microbe securely ensconced within the most interior portion of the human system?

Deafness.—We find the following in one of our exchanges: Just now the medical world is engaged in discussing the new device for deafness called sound disc. No invention of late has attracted so much interest among the medical profession. Its perfection, which is now an established fact, has resulted in the overthrow of many pet theories of there being no relief for a vast number of cases of deafness. This ingenious discovery was made by H. A. Wales of Bridgeport, Conn., and coming as it does with the approval of some of the leading aurists of the world, it can hardly fail to prove of great value to the profession and the afflicted.

Engineering Notes.

Flooding the Sahara.

From time to time hints have been given out as to the feasibility of flooding the great Desert of Sahara, which some maintain is considerably below the level of the Mediterranean sea. If this is a fact, it appears at the first glance to be comparatively easy. In the thousands of miles of sea-bound coast, one would think a spot of low level could be found to admit the water on a large scale, which in time might overcome evaporation, and rising above and covering the sandy desolation, change the desert aspect to a clime of health and beauty on the higher lands. There are many considerations which should be taken into account before such a great engineering feat is undertaken. First, what amount of evaporation would be carried on over such a vast area of the earth's surface? What would be the result of such a great weight brought to bear on a fresh locality? Would it have any appreciable effects on the earth's rotation? Would the cooling which might be occasioned lead to any serious agitation in the air? Are the lower levels of the desert inhabited to any great extent? What are the respective levels of the Red and the Mediterranean seas and the Atlantic ocean?

The area of the desert is about 2000 miles in longitude by 1000 in latitude. The proposed connecting canal or route of inflow from the Mediterranean is about half-way of the distance of the desert in its longitudinal direction.

Another Scheme.

Somewhat in conflict with the above scheme is another for opening up for commercial enterprise the borders of this arid region by a continental railroad some 2000 miles in length. Recent information says that a Commission of Inquiry investigating the trans-Saharian railway schemes has approved the route from Constantine and Biskara in Algeria across the desert to Lake Tchad. This route is by way of Tlemsen and Amesoltah and traverses the Tuarick country. The length is 2000 miles. This project is backed by the Banque de Russe et Francaise.

Stanley on the Sahara.

In connection with the above, the opinion of Mr. Stanley in regard to the character of this desert may be found interesting. An interview with this noted traveler is given as follows:

Mr. Stanley thinks Lord Salisbury underrates the light land in Sahara. I asked whether an engineer would not be roasted to death in driving an engine through that desert.

"No," replied Stanley, "not if he were used to the climate."

Mr. Stanley thinks the Sahara valuable just on account of the sand.

"It is awful business," he remarked, "to lay down rails in any tropical country where vegetation is rank. Every sleeper in the Aspinwall & Panama railway cost a navvy's life. The fever caused by the exhalations of the rotting vegetation under the hot sun is mortal, but in the Sahara there is nothing of that."

Canal Projects in France.—The project for making Paris into a port is now completed, and nothing remains but the sanction of the Government to put the work into the hands of the contractors. Hitherto the Government has kept aloof from the proposals until its promoters were in a position to carry out the undertaking to a successful issue, a caution engendered by the recent failures of French engineering undertakings. The promoters have now raised the necessary capital, amounting to £5,400,000, and it is probable that the sanction of the Government will be given to the project, and the work of canalizing the Seine with a view to allowing the passage of sea-going vessels from Havre to Paris will be proceeded with, and extensive docks will be constructed at Pantin, on the northeast of the city. Another proposal is for the construction of a canal to connect the Mediterranean with the Bay of Biscay, with the intention of intercepting a great part of the shipping which at present passes through the Straits of Gibralter. If these two projects be carried out, they will have an immense effect on the trade of France.

Recent Advices all indicate that work on the Nicaragua canal is to be prosecuted from now on with great activity. The construction company has just purchased a large outfit at Colon, consisting of seven dredges, 15 lighters, and a quantity of tools, machinery and supplies. The surveys of the western section of the canal are nearly all finished, and our Government, which is in sympathy with this great enterprise, has sent the Kearsarge to Colon to afford any protection that may be needed, and present appearances are all favorable for the uninterrupted continuance of the work. The completion of this canal will have a very decided effect upon the lumber trade of the Pacific Slope.

Electricity.

Electricity in War.—The possibilities of the use of electricity in warfare at present are only limited by the amount of machinery that can be handled. Those who are continually urging the Government to build vessels of war with a view of destroying life and wasting the public money, should be trotted out into some wilderness and given an opportunity to practice on each other with lightning as their weapon, for the benefit of those who know that it is time that war should cease altogether, and those who are picnicking on Government vessels at great expense in the Mediterranean should be called home and instructed in the art of earning their own living. Why should we fight when national boundaries are becoming less defined and all peoples are drawing together as one people? Why should we kill each other? A late invention is the attachment of an electric motor to a Gatling gun, increasing its capacity from 500 to 1000 shots per minute. This, says a contemporary, is looked upon as a wonderful increase in destructive power, but it must not be lost sight of that electricity is lightning and that in handling it we are in our infancy. Fortunately it is a law of nature that those who are given the knowledge of its occult forces are at the same time disarmed of the desire to use them, and the desire for money-making decreases in the same ratio.

The Generation of Electricity by the Flow of the Tide.—A French engineer, M. Decœur, has elaborated a project by which he proposes to supply electric-power to Paris. He would generate the required electricity by utilizing the flow of the ebb and flood on the coast and transmitting it to the French capital. For this purpose he intends to construct, near Havre, two large basins joined to each other, into one of which the sea at flood-tide flows over a dam, while during ebb it flows out of the other into the sea again. At the inlet and outlet M. Decœur proposes to erect a number of powerful turbines, for tranamitting the energy of the water. The mechanical energy thus produced M. Decœur estimates, with a tide of 18 feet, which is the average at Havre, a 6 horse power per hectare of basin area. He intends parting off, by means of a dam 16½ miles long, an area of 7000 hectares between Havre and Tancarville from the sea and the Seine respectively, and thus creating 42,000-horse power, which power he transforms into electrical energy and transmits to Paris. M. Decœur's scheme is looked upon with favor, and although the estimated net profit of eight and one-half million francs is too high, there are indications that it will ultimately be carried out.

Improved Means of Electrical Transmission.—An electrician has just patented a device whereby it is claimed that large quantities of power can be transmitted long distances by means of alternating currents. By the use of this, water-power can be utilized at long distances. The potential of the current is made very high in the wires, thereby reducing the cost of wire to minimum. He has also patented a sort of electrical tow-horse for street railways. It is often necessary at curves or on grades to exert large quantities of power for a moment in starting or moving cars. When a car is quite a distance from a station or on a grade, it takes a tremendous current to move it. This momentarily creates a great drop in potential. To meet this emergency the professor places storage batteries at different points along the line. These batteries are made to be capable of quick discharging and are of rather limited capacity, the object being merely to supply a large volume of current for a few moments in the starting of the car. After using, they are immediately recharged again by the current.

Spectacular Electricity.—The New York *Sun* tells of an electrician of that city who has made a specialty of spectacular electricity, who says that the day is not far off when electrical fireworks will supersede those now used. He declares that for a comparatively moderate outlay he could arrange an electrical display for the city which would last for many years, and could be repeated as often as desired. It would comprise rockets, Roman candles, wheels, Niagara Falls, and all the modern pyrotechnic effects.

Copper.—"Never was the copper outlook better than at the present time," said one of the largest dealers in the country to a Butte *Inter Mountain* scribe. "The price remains stable, and that at figures that cannot but be satisfactory to the producer. I see that copper is quoted at 16 40 this morning, but I also notice that all who buy are obliged to pay 17 flat, and the holders are not anxious to sell at that. Large as is the supply, the demand is still greater and has become established as such. This makes the market certain within all reasonable bounds and fixes the price for the future. Of course there will be fluctuations, as everything is uncertain, but it would be difficult to construct any combinations of circumstances that would be more favorable to the red metal. Of course there may be breakers ahead—one can't always tell; but so far as can be seen now there is nothing before us but clear sailing."

The shipments of quicksilver from Calistoga in August amounted to 540 flasks.

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Passing Events.

The starting up of the works of the Tacoma Smelting and Refining Co. last week is quite a notable event for the mining interests of the Northwest. There is still room for many more enterprises of a similar character on this coast.

In the death of Governor Stevenson, Nevada loses one of her most prominent men, and one who has been identified with the mining and milling interests of the State for many years.

The resumption of pumping the water ont of the Gold Hill mines last week means the reclamation of territory for prospecting purposes fully as extensive as that now possessed by the mines. Mr. Dow of this city, whose system has been adopted, is sanguine of success.

It is announced that a new coal-field in Mendocino county is to be opened by capitalists. The beds are not very far from the coast at Fort Bragg, and shafts are being sunk to test the deposits thoroughly.

THE DODGE PULVERIZER.—Among other places, the Dodge pulverizer has been put in operation on gold ore at Juneau, Alaska. Archibald Campbell of that place writes to Mr. Dodge as follows: "I am having no trouble with your pulverizer. It is the best machine I know of for free-milling rock."

SOME portions of the State were visited by rains on Wednesday of this week.

Professional Dummy-Directors.

The publicity given to the mismanagement of the Hale and Norcross mine has brought to the front a discussion of the proxy system of voting stock so as to carry mining-share elections. It is this, as now carried on, that allows the more unscrupulous, if so disposed, to elect dummy-directors who in their turn will do the bidding of those to whom they are indebted for their positions of trust. Stock-brokers, mining secretaries and others in whose name stock stands as trustees for real owners give their proxies for the shares, knowing that the act is, to call it mildly, illegal.

In the full knowlege of the recent undenied public charges against the management of the Hale and Norcross mine, there can be no doubt but the genius of the Comstock lode displayed his master hand when he brought forth the dummy-director.

He is not a myth. His large salary drawn by assessments from stockholders renders him conspicuous, if not relatively dear. No matter what disguise he may assume, the professional dummy-director, held in position by the hidden hands of those whom public opinion charges with looting the mines, always shines through it, and the poor stockholder foots the bills for the masquerade.

M. W. Fox, chairman of the Executive Committee of the Mining Stock Association, related his experience to a representative of the MINING AND SCIENTIFIC PRESS, which will serve as an object-lesson to our readers.

Said Mr. Fox: "Last July, when the report reached us that ore had been struck in the Potosi winze below the 930 foot level, I being a large stockholder, applied at the company's office in this city for a permit to examine the mine. The company's president informed me that a permit was not necessary; that he would write the acting superintendent, Mr. Pendergast, and that I would be admitted to the mine upon my arrival in Virginia City. Believing this statement to be sufficient, I left for the Comstock that afternoon. The day following my arrival at Virginia City, I presented myself at the mine, inquired for Mr. Pendergast, and upon his appearing I made known to him the object of my visit—to examine the mine. Mr. Pendergast informed me that he could not permit any one to enter the mine without a written order from one of the Joneses, Mr. Hayward, Mr. Hobart or Mr. Hamilton, the superintendent. I then asked him if the president of the mine had not written to him giving direction or orders to have me admitted to the mine. In reply, Mr. Pendergast said that the president had not yet written to him, and added that even had he done so it would do no good, because he had no authority to give such an order.

"Now what do you think of the position occupied by this president? The bona-fide stockholders pay this man more than $1000 a month to hold a position of trust for them in various mines of the Comstock.

"This president, acting as a trustee for me, and representing my stock as well as the stock of thousands of other stockholders, let me go to Virginia City at a loss of time and money to myself when a word from him would have been sufficient to show me that he had not the power to admit me to the mine and that my application should have been made elsewhere."

THE PATENT OFFICE.—The report of Commissioner Mitchell of the Bureau of Patents for the fiscal year ended June 30th, shows that 46,140 applications and caveats were received, as against 42,047 for the previous year. The receipts of the office for the year were $1,547,203; expenditures, $1,081,175; surplus, $266,030, as against a surplus of $186,359 for last year. The balance in the Treasury on account of the patent fund is $3,790,556. During the last year the office disposed of 4596 cases in excess of the number disposed of during the previous year.

FISH DISCOVERIES.—During her late cruises the Albatross discovered 27 new species of fishes on the coast of California. All of them are from a greater depth than 100 fathoms, and most of them are small, so that no additions to the food fishes have been made. These, with the 26 new species discovered by Dr. and Mrs. Eigermann in California shallow waters, and the one described by Dr. Brown, considerably increase the number of species from this State.

Modern Marine Boilers.

Pacific Mail Steamship Co.'s Steamer "City of Sydney."

In these days of keen competition among producers of marine machinery, it is absolutely necessary to be in possession of the most modern appliances, not only for reducing to the lowest point the cost of production, but also to insure work of the highest class. Even here the manufacturer must not rest; he has to exercise his talents in order to get ahead or at least to keep pace with the rapid strides made during the present year in marine engines and boilers. With regard to the former, we admit that the progress made in its development is more marked than in the latter.

Since the introduction of triple and quadruple expansion engines, with pressures of 150 to 180 pounds per square inch, a complete revolution in the matter of boiler construction has taken place. The thick plates now in use, consequent from the increased pressures, have necessitated the employment of machinery in constructing a modern marine boiler to a much larger extent than has been the case hitherto. We find that it is absolutely a necessity that hydraulic riveting should be adopted wherever practicable, that all holes should be drilled instead of punched, and again the flanging of plates done by machine, instead of by hand, and the use of steel plates throughout in place of iron. This, then, is the actual outcome of modern marine engine improvements, and, although many steamship owners have not yet adopted the modern system of triple engines when boiler renewals are required, still they naturally expect to have their boilers constructed even for the lower pressures on the most approved plan, insuring to them workmanship of the very best description.

Such is the case with the Pacific Mail Steamship Co. when placing the order for the renewal of the boilers of their steamer, City of Sydney, together with a complete overhaul of the ship and machinery, in the hands of the Risdon Iron and Locomotive Works of this city. The ability of this firm to cope with work of this description is too well known on the Pacific Coast to need any comment from us. The accompanying illustration furnishes our readers with a fair idea of the magnitude of the work, which now stands completed in the shop of the Risdon Iron Works, ready for shipment on board as soon as the repairs to the hull are complete.

It will be seen that the boilers are six in number, placed three on each side of the vessel, and fired athwartship; with the exception of tubes and braces, they are constructed throughout of mild steel. Each boiler is 13 feet mean diameter and 10 feet 6 inches long, and is fitted with 3 corrugated furnaces 36½ inches minimum external diameter, 7′ 6″ long, having separate fire-box to each furnace. The number of tubes in each boiler is 204, and are 3¼ diameter; 32 of these are fitted as stay tubes. The furnace fronts are flanged outward to receive the furnaces, this system affording the ability of hydraulic riveting. The back head is also flanged ontward for attachment to shell plates for the same reason; all the rivet-holes throughout have been drilled in place; the circular and longitudinal seams are double riveted, the latter fitted with butt straps inside and out, all of which are riveted up with hydraulic pressure. The collective heating surface of the six boilers amounts to 9612 square feet, and a total grate area of 324 square feet.

Considerable attention has been given in designing the boilers to provide ample means for cleaning and the thorough internal examination, a point which is too often overlooked. They have been constructed to conform with United States laws for a working pressure of 80 pounds, and have been tested by hydrostatic pressure to 120 pounds, and found to be perfectly stanch and water-tight. Each boiler is fitted with a main stop, spring loaded safety, separate main and donkey feed, scum and blow-off valves. The main feed is delivered into the boilers through Matthews' patent feed-heating apparatus, a system which has proven highly successful not only in prolonging the life of the boiler but also in the economy of fuel. The steam generated in the boilers passes into a superheater 12 feet diameter and 15 feet long, having an internal flue 7 feet 4 inches diameter. The superheater is also fitted with stop and safety valves, so that connection from all the boilers with main engines may be severed by the closing of the one stop valve. The work throughout during construction, and also the repairs to hull and machinery, have been conducted under the supervision of Mr. J. Matthews, the Pacific Mail Co.'s marine superintendent. The progress the Risdon Iron Works have made with the work justifies us in saying that they will be enabled to place the steamer again on her station early in November.

Timber and Mines.

Senator Sanders, during the consideration of the House bill to repeal the timber-culture laws, offered an amendment providing that in the gold and silver mining regions of the State of Nevada and those States and Territories in which there are public lands containing timber, and where there is no United States law authorizing the sale of such timber lands, residents of such States or Territories, if prosecuted for cutting timber, may plead that it was cut for agricultural or mining purposes. After some modification this was agreed to.

It is to be hoped that some such step as this will be taken and become the law. The miners need the timber to carry on their work, for, with them, it is absolutely indispensable. A year or two ago, a lot of men were arrested for cutting timber on public lands, when they were using said timber in developing the mineral resources of the region, and the timber was of no use for anything else.

There are plenty of persons deserving prosecution for wasteful cutting of timber without going after those miners who only cut the timber they need in their business. Quartz mines cannot be developed without the use of timber, and plenty of it, and the law should be plain in permitting its use for that purpose.

Congress and Railroad Lands.

Senator Plumb has reported favorably from the Public Lands Committee the bill declaring that railroad land grants shall not be held to include land containing valuable deposits of gold, silver, lead, iron or other metal, unless the same is specified in the grant.

Some definite action like this by Congress, if taken a long time since, would have saved much trouble and litigation and been of the greatest advantage to the mining interests of the Rocky mountain and Pacific Coast sections. The cloud thrown on the title of many mining properties by the claims of the railroad companies has kept down the valuation of said properties and prevented the owners from selling or working advantageously. The recent rulings and decisions, however, have pretty well cleared away these clouds on titles. Still, an official expression by Congress on the subject will be of great advantage and set the question finally at rest. It was never the intention of Congress to let the railroad companies have the mineral, and only technical grounds were used to base the claims of the companies.

Reopening Old Mines.

The last monthly cleanup of the Wildman, in Amador county, was one of the best ever made at that prosperous mine. Rumor has it that the yield amounted to over $20,000, or $1000 to the stamp.

And yet this mine has been lying abandoned for 20 years until a short time since when it was reopened and reworked. Now it shows a yield of $20,000 in gold for one month's work.

There are a good many more of these abandoned mines in this State, which would pay equally well in proportion, should money be put into them for development and machinery. The trouble is that the owners of such claims have not the coin to pump them out and start up. The conditions under which we mined 20 years ago were materially different from what they now are. Transportation, supplies, etc., are cheaper, we know how to mine and mill better, labor costs less, and mines that would not pay then can be made profitable now. Under such circumstances it is a wonder that no more of the old mines are reopened.

H. A. TRUE of the smelting works of El Paso, Texas, is in Colton with a view of establishing reduction works if a sufficient quantity of smelting ore can be found in the mines near there.

The Gold Belt of California.

Ancient River Channels and Gravel Deposits.

NUMBER II.

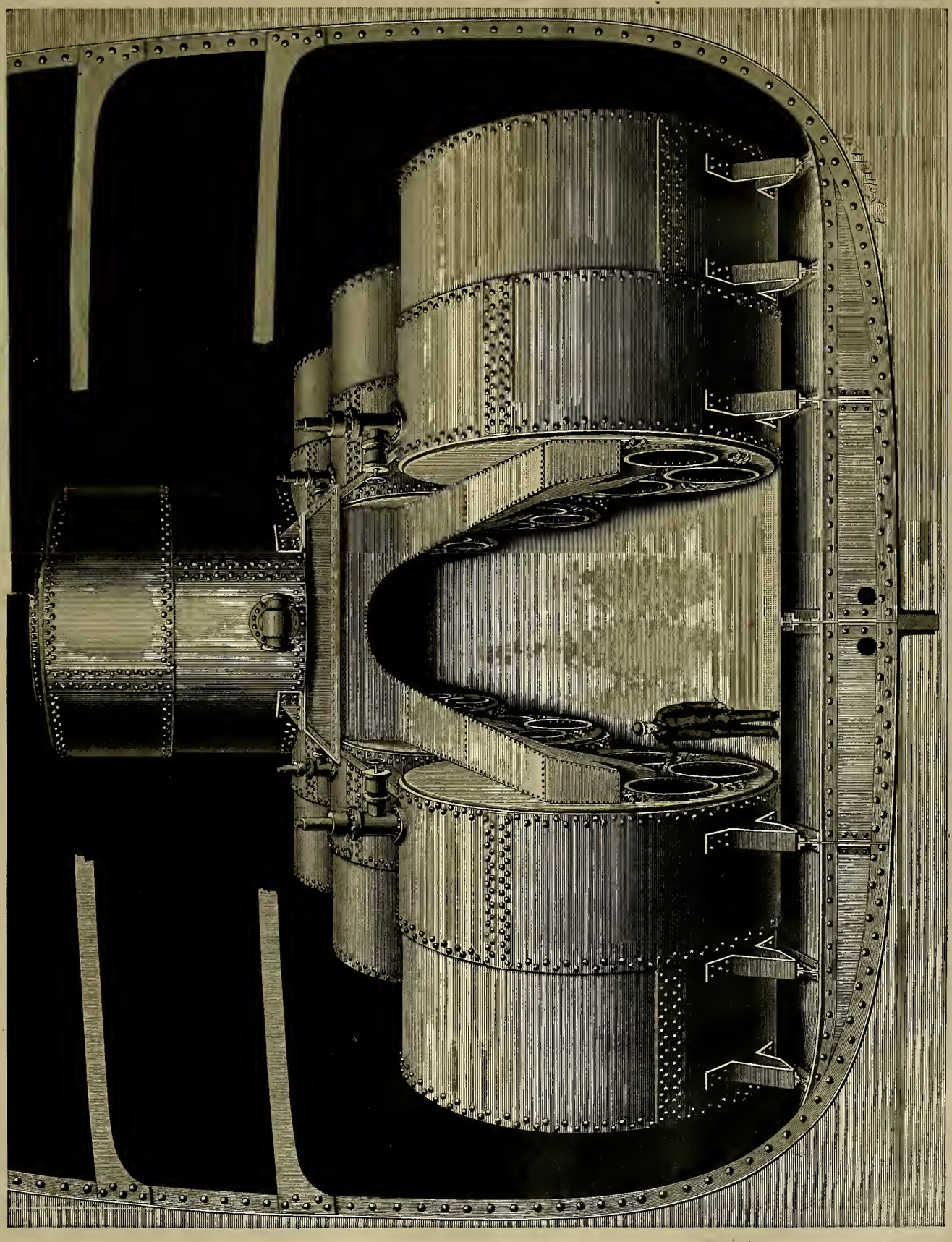
[Written for the MINING AND SCIENTIFIC PRESS by STEPHEN BARTON of Kernville, Cal.]

placers.

Perhaps above this line the fine gold may still remain buried in the deep channels which underlie the lava-capped ridges, while lower down it may be alloyed by gold from the quartz ledges of the foothills.

(To be Continued.)

The Gates Ore and Rock Breaker.



Supplement to the Mining and Scientific Press.

Boilers of P. M. S. S. Co's Steamer "City of Sydney"

BUILT BY THE RISDON IRON WORKS, SAN FRANCISCO.

Assessment Notices.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of August, 1890, an assess-

vanced 20 per cent, and importers have advanced their stock 50 per cent.

their office. If not stopped promptly (through oversight or other mishaps) do us the favor to write again.

Books on Assaying.

BY C. H. AARON.

PART I.—Gold and Silver Ores.—Price $1

SECOND EDITION.

This work is written by an experienced metallurgist who has devoted many years to assaying and working precious ores on the Pacific side of the American Continent.

Engineer, formerly of the California State Geological Survey.

MINING AND SCIENTIFIC PRESS.

W. R. EWER.

Professional Dummy-Directors.

The publicity given to the mismanagement of the Hale and Norcross mine has brought to the front a discussion of the proxy system of voting stock so as to carry mining-share elections.

Modern Marine Boilers.

Pacific Mail Steamship Co.'s Steamer "City of Sydney."

In these days of keen competition among producers of marine machinery, it is absolutely necessary to be in possession of the most mod-

boilers with main engines may be severed by the closing of the one stop valve. The work throughout during construction, and also the repairs to hull and machinery, have been conducted under the supervision of Mr. J. Matthews, the Pacific Mail Co.'s marine superintendent. The progress the Risdon Iron

SOME portions of the State were visited by rains on Wednesday of this week.

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The superheater is also fitted with stop and safety valves, so that connection from all the

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The Gold Belt of California.

Ancient River Channels and Gravel Deposits.

NUMBER II.

[Written for the MINING AND SCIENTIFIC PRESS by STEPHEN BARTON of Kernville, Cal.]

While the flora of these old deposits speak unmistakably of the climate, we must look to the fauna for the true index to their age. I have known of no mammal fossils of present species coming from these ancient gravel deposits except the "Mioosns Skull," to which Prof. Whitney has aided to draw attention. And I may here observe that there is no more reason for believing that that relic of our ancestors was any more of the species of the man of to-day than there is for believing that the fossil, three-toed horse was of the same species of the pure Arabian of to-day. I have seen an incisor tooth—evidently from a ruminant—from these ancient gravel deposits, which was nearly three inches across its face. I have also seen a conch shell five inches in diameter, and highly petrified. As to the mastodon, I believe his advent was altogether subsequent. The firm of Smith & Rider, once engaged in the lumber business at Columbia, had several femurs, and I think three under jaws of these fossil animals, and other bones in proportion. A hotel-keeper at Kinoaid's Flat, in Tuolumne county, had a portion of a tusk, some seven inches in diameter and four or five feet long, holding its size throughout, and many other bones found about the same time, prior to 1858. The bones held by Smith & Rider were found at Gold Springs, on the bluff of the Stanislaus river, where the cutting down of this channel has formed a drainage of the mountain limestone which forms the bedrock beneath the ancient gravel deposit at Columbia. The springs are therefore very much more modern than the ancient gravel; and yet these bones were very much more modern than the springs, notwithstanding that these springs, at their present rate of depositing calcareous matter, must have been, at my estimate, 22,000 years in depositing the calcareous tufa with which the bones (and the whole mountain-side) were covered. At this point the Stanislaus has cut down 1300 feet below the bed of the ancient channel, and by examining almost any of these old channels, we shall find where the miner has unearthed an abundance of evidence of the gradual decadence of the stream. All streams carry their curves farther down as they deepen, by the simple act of impinging upon and undermining the outer bank. Hence the miner has found that he may look for a series of river bars on the point projecting into the inside of the curve.

We find these bars at all altitudes from the top of the bluff to the present bed of the stream. Of course they do not all occur on one point. There will be a series of bars of the same altitude, or rather on the same grade, ranging from point to point. At another place there will be another series at a different altitude and on a corresponding grade. In studying these evidences of gradual change, the first impulse is for the mind to become bewildered at the vastness of time necessary to enable a river to make such havoc with hard granite. Then again we console ourselves with the question, if the earth was not always here, where did it come from? I have seen (in the Tuolumne grove) Sequoia trees six or seven thousand years old standing on the cement which caps one of these old channels, and yet there was absolutely no evidence of cutting down of the bed of the gulch since these trees took root. On the South Fork of the American river is a good place to study this gradual subsiding of the stream; and yet, take gold from any of these bars within the canyon, and the banker will tell you at once that it is South Fork gold, though it only requires an amateur to tell the gold of different streams. The gulches putting into the South Fork from the south all have gold of the same type, for the reason that they all draw their gold from the Emigrant ridge, jutting down toward Placerville, and which the old Carson road followed for many miles. The amount of hidden wealth beneath this ridge is for future generations to determine.

I had no intention of implying, however, that the character of gold does not change at long intervals up or down the stream. I have hoped some day to see a correct diagram of assays, and expected to deduce from it some proof as to the point from which the gold originally came. If we draw a line across all the channels, starting, say, from White Rock in El Dorado county, and running to the east of south through Smith Flat and Indian Diggings in the same county, thence through Volcano in Amador county, Murphys in Calaveras county, and thence to Columbia and Sonora in Tuolumne county, we shall be able to discover two important facts, if not more. First, we are on a line of high assays, where the average assay of the gold dust taken out is above .930. Parallel with this line, five miles away, we shall find, on either side, the average assay falling below .850. Second, we shall find that this line of high assays traverses the central trend of the great lime belt of the "southern mines." We shall also find that we are above and farther east than the mother lode, so called, and that on this line lies the cream of the California placers.

Perhaps above this line the fine gold may still remain buried in the deep channels which underlie the lava-capped ridges, while lower down it may be alloyed by gold from the quartz ledges of the foothills.

(To be Continued.)

The Gates Ore and Rock Breaker.

The ordinary impression that almost anything will do for a crusher is a great mistake, as many have found to their annoyance and cost.

The fact is that the crusher is the most important piece of machinery connected with any mill. When this gives out, all work stops. Then it is conceded that such reduction as can be made with a crusher is done with less expense than with stamps or any other form of mill. The extent to which the Gates crusher is coming into use for quartz work, stamps it as a machine of unusual merit.

One of the important features claimed for this is its capacity for fine work. The limit in ordinary jaw-crushers in this direction, as is well known, is in cubes that will pass a 2½ or 3" ring. With the Gates, everything can be reduced down to 3 8 or ¼", with say 1-3 of the product fine enough to pass through a 15 or 20 mesh screen.

By this means the rougher part of the work, that ordinarily falls to the stamp or rolls, is done by the crusher, greatly facilitating the process of reduction, while the wear of the more expensive machinery is much reduced. Mills that are using this machine claim an increased output of at least 25 to 30 per cent. It will readily be seen what an advantage this alone affords in any milling enterprise. Among other claims made for this machine is that of great saving and cost of wearing parts, in other words, records of working show an average of 12,000 or 15,000 tons with one set of wearing surfaces, and sometimes greatly exceeding this, to less than 1 3 of the above-named amount for ordinary jaw-crushers. A considerable saving in power is also claimed. These are considerations which have already attracted much attention among mining men who are looking to economical results.

The well-known Homestake Mining Co. in the Black Hills, Dakota, purchased some six months ago a Gates crusher for purposes of test and comparison, with the result that they have recently thrown out their Blake crushers —16 in number—and substituted the Gates therefor.

When a machine that has always ranked as the best is thus discarded after a thorough and exhaustive test made with reference to determining which afforded the most advantages, the experiment ought certainly to be of value to users of such machines.

The old plea of "let well enough alone" will not do in these days of progress. While the element of competition does not enter into mining as in other departments of business, yet improved machinery tends, by reducing cost, to enlarge the field of operations as well as to enhance profits.

Most experienced and even conservative mining men are not slow in adopting appliances that show such advantages in practical working.

New Incorporations.

The following companies have been incorporated, and papers filed in the office of the Superior Court, Department 10, San Francisco:

BELLEVIEW M. & AGRICULTURAL CO., Sept. 19. Location, Tuolumne Co. Capital stock, $1,000,000. Directors—John W. Coleman, A. P. Hotaling, Thomas Bell, John W. Maxwell and George Staacke.

SOUTHPORT LAND AND COMMERCIAL CO., Sept. 19. Capital stock, $500,000. Directors—A. W. Rose, Jr., W. E. Sell, R. E. Wilson, H. A. Parrish and J. T. Peck.

LEACH LUMBER CO., Sept. 20. Capital stock, $500,000. Directors—A. M. Leach, Margaret I. Leach, J. Levi, Sr., J. Levi, Jr., and O. H. Greenwald.

PACIFIC CONSTRUCTION CO., Sept. 22. Object, to construct, manufacture, mine and transact commercial business generally and operate railroads, telegraph lines, steamers, construct bridges and wharves; also to run a freight and passenger ferry between the western end of the California & Nevada railroad tracks in Oakland and this city. Capital stock, $500,000. Directors—J. W. Smith, Abner Doble, J. J. Scrivner, C. K. Klog and M. J. Keller.

CHARLOTTE RAISIN VINEYARD CO., Sept. 23. Capital stock, $64,000. Directors—I. H. Morse, G. A. Fisher, W. R. Drake, H. L. Davis and G. W. Turner.

SAILOR CONS. M. CO., Sept. 24. Capital stock, $600,000. Directors—H. S. Dexter, W. Dreffenbacher, G. Webe, G. Dawson and H. Eickoff.

CORONADO ISLANOS STONE AND IMPROVEMENT CO., Sept. 24. Capital stock, $100,000. Directors—O. T. Dyer, F. V. Macdonald, D. S. Dorn, S. Miller and C. Waterhouse.

MINERS IN POLITICS.—It is worthy of note that both of the political parties, one in its platform and the other by resolution of its committee, approve of "such legislation as will allow hydraulic mining under restrictions that will not allow such mining to injure farmers or the navigable rivers of the State."

THE price of manufactured sealskins has advanced 20 per cent, and importers have advanced their stock 50 per cent.

Assessment Notices.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of August, 1890, an assessment, No. 19, of six (6) cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 11, No. 303 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of September, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 20th day of October, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California Street, San Francisco, California.

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And 170½ Second St., Portland, Or.
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Send for Circular.
E. P. HEALD, President.
C. S. HALEY, Secretary.

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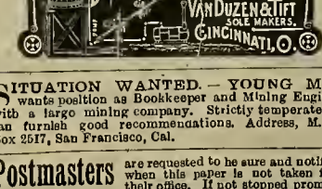
Pioneer Mining Office of the Northwest Coast.
Having the largest permanent brick assay furnaces, chemical laboratory and mining office on the Northwest Coast, with a collection of about 4000 samples of the ores of Alaska, British Columbia, Oregon and the Northwest Territories; and having made personal examinations of nearly every mining camp on the Pacific Slope, from California to Alaska, I am prepared to do any class of legitimate and honest mining work, such as EXAMINING, ENGINEERING, SAMPLING AND REPORTING ON THE VALUE OF ALL MINERAL, COAL AND FIRE-CLAY PROPERTIES, BUILDING STONES, EARTHS, ASSAYS AND ANALYSIS OF ORES, WATERS, CHECK SAMPLES OF ORE, PULPS, "ORGANIC ANALYSIS" WORK, and in fact any work connected with the office of a first-class mining geologist and chemist. Any information mining men may desire to know relative to the MINERAL OR COAL RESOURCES of the entire Pacific Northwest will be honestly given. Address **Dr. Willis E. Everette,** Consulting Mining Geologist and Chemist, 1318 E Street, Tacoma, Wash.

"A RIGID EARTH," being devoted to Geology as Applied to Mining. By STEPHEN BARTON. In this work the author addresses himself to intelligent Miners who have, to some extent at least, familiarized themselves with the accepted theories of elementary geology. He has grouped together numerous observed facts tending to disprove the igneous theory, and to establish the proposition that below the action and influence of the atmosphere all fissures grow narrower with depth—that metal-bearing veins are produced by causes acting near the surface; and that the realm of successful mining never penetrates the earth one mile. PRICE $2.00. J. C. WARD, General Agent, 64 Main Street, Visalia.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SITUATION WANTED.—YOUNG MAN wants position as Bookkeeper and Mining Engineer with a large mining company. Strictly temperate and can furnish good recommendations. Address, M. E., Box 2517, San Francisco, Cal.

Postmasters are requested to be sure and notify us when this paper is not taken from their office. If not stopped promptly (through oversight or other mishaps) do us the favor to write again.

Books on Assaying.

By C. H. AARON.

PART I.—Gold and Silver Ores.—Price $1
SECOND EDITION.

This work is written by an experienced metallurgist who has devoted many years to assaying and working precious ores on the Pacific side of the American Continent. He writes whereof he knows from personal practice, and in such plain and comprehensive terms that neither the scientist nor the practical miner can mistake his meaning.

The work, like Mr. Aaron's former publications ("Testing and Working Silver Ores," "Leaching Gold and Silver Ores") that have been "successfully popular" is written in a condensed form, which renders his information more readily available than that of more wordy and less conscientious writers. The want of such a work has long been felt. It will be very desirable in the hands of many.

Table of Contents:

Preface; Introduction; Implements; Assay Balance; Materials; The Assay Office; Preparation of the Ore; Weighing the Charge; Mixing and Charging; Assay Litharge; Systems of the Crucible Assay; Preliminary Assay; Dressing the Crucible Assays; Examples of Dressing; The Melting in Crucibles; Scorification; Cupellation; Weighing the Bead; Parting; Calculating the Assay; Assay of Ore Containing Coarse Metal; Assay of Roasted Ore for Solubility; To Assay a Cupel; Assay by Amalgamation; To Find the Value of a Specimen; Tests for Ores; A Few Special Minerals; Solubility of Metals; Substitutes and Expedients; Assay Tables.

The volume embraces 130 12mo. pages, with illustrations well bound in cloth; 1889. Price, $1, postpaid. Sold by DEWEY & Co., Publishers, No. 220 Market street, San Francisco.

PARTS II AND III.
Lead, Copper, Tin, Mercury, etc.
Price $1.75.

This book is entitled "Assaying—Parts II and III," and is separate from Part I, and treats of Gold and Silver Bullion, Lead, Copper, Tin, Mercury, Zinc, Nickel, Cobalt, etc.

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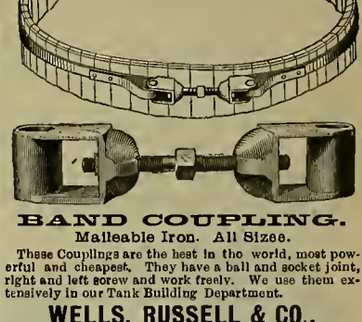
Gold and Silver Bullion; Apparatus; Melting Bullion; Assaying Bullion; Humid Assay of Silver; Manipulation, etc.; Lead Ores; Copper Ores; Volumetric Assays; Parkes' Process; Amalgamation; New Process; Preparation of Potassium Zanthate; Electrolytic Determination of Copper in Ores, etc.; Assaying of Tin Ores; Assaying of Mercury Ores; Assaying of Zinc Ores; Assaying of Zinc Ores, New Method; New Assay of Nickel and Cobalt; Assay of Chromium; Assay of Bismuth; Assay of Arsenic; Assay of Antimony; Assay of Sulphur; Assay of Salt; Appendix to Part I; Notes on Crucible Assays; Weighing by Oscillations; Appendix to Part III; The Assay of Lead; The Assay of Copper.

There are 160 12mo. pages with illustrations in the volume which is bound strongly in cloth. Price postpaid, $1.75 Sold by DEWEY & Co. Publishers, No. 220 Market St., S. F.



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These Couplings are the best in the world, most powerful and cheapest. They have a ball and socket joint, right and left screw and work freely. We use them extensively in our Tank Building Department.
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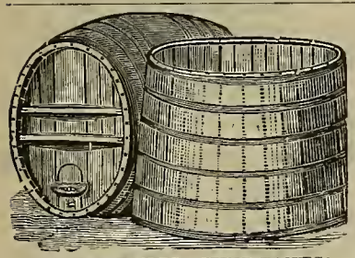

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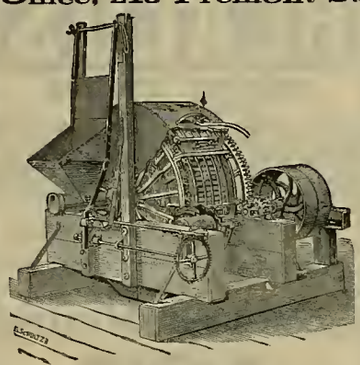

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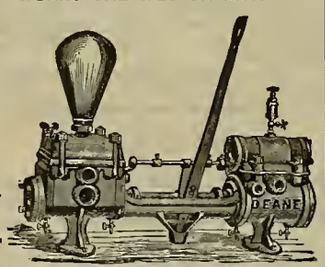

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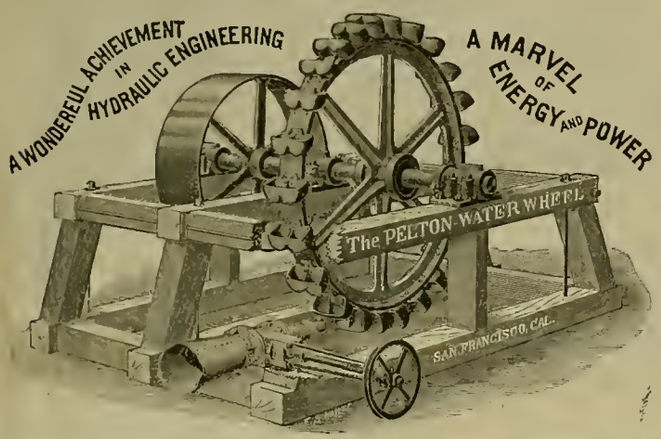
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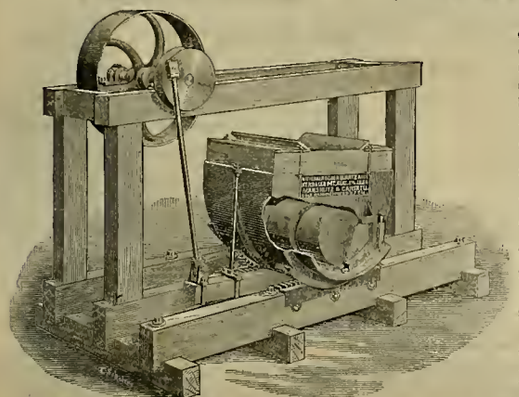

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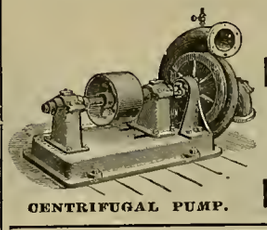
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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Sept. 25, 1890.

General trade is reported exceedingly active, but not more so than usually obtains in the fall of the year. Money is easy, with no particular call from any branch of trade or speculation. Remittances from the interior are quite free.

MEXICAN DOLLARS—The market is quiet. The recent decline in silver has a depressing influence. Quotations are given at from 88@89c.

SILVER—The Mint-counter rate has ruled at $1.13½ an ounce. Washington telegrams report as follows: On 22d, the silver offered the Treasury aggregated 1,035,000 ounces. The amount purchased was 250,000 ounces at $1.150. On 24th, the amount of silver offered to the Treasury aggregated 338,925 ounces, and the amount purchased, 140,000 ounces, as follows: 25,000 ounces at $1.136, 90,000 ounces at $1.13625, 25,000 ounces at $1.1375. The total purchased, including to-day's purchases, under the new law, is 7,172,474 ounces, leaving about 107,000 ounces to be purchased during the remainder of this month. On Oct. 1st, the Department will commence buying the regular quantity, 4,500,000 ounces, per month, making each month end with the last day of the month, instead of the 13th day as was done the first month's purchasing.

QUICKSILVER—The market shows a firm tone. The demand is fairly active for the season. The receipts the past week aggregate 195 flasks, and exports by sea, 10 flasks to Auckland.

LIME—Receipts the past week aggregate 4209 bbls. The demand continues free, but dealers do not care to carry stocks, owing to the lateness of the season.

BORAX—The market is firm, with a steady market reported at the East.

LEAD—The market is very strong. The East reports a strong and higher market under firm holding by the pool. English advices report better markets on that side.

COPPER—The mines on this coast are reported to be turning out their regular quota. New York advices report a strong market, with Lake sold ahead at 17c. Arizona ingot is firmer at 15¼c. Casting copper is 14⅝ to 14⅞c. A London cable to the *Iron Age* of Sept. 18th, reports as follows: The control of the market is in strong hands, and a still further rise in prices is considered likely.

TIN—The local market is cornered and pending arrivals, due on Saturday, quotations are given at 25@26c. Large consumers refuse to take at these prices, preferring to wait for the arrival of the Australian steamer. At the East and in Europe the markets are very strong. The advance in Europe is due to higher prices for silver and threatened labor strike.

IRON—The market is fairly steady. The stock here is being steadily depleted, but it is claimed that free shipments have been and are being made from England. A cablegram from London to *Iron Age*, Sept. 18, says: Operations have been on a larger scale, and stimulated the prospect of a strike by furnace workers taking place next month. Reported scarcity of fuel and consequent increased cost of production also tend to promote speculation, while rapidly declining stocks and improvement in the trade demand serve to strengthen the position materially.

COAL—Imports the past week aggregate as follows: Overland, 20 tons; Seattle, 7986; Tacoma, 6300; Coos Bay, 720; Nanaimo, 3480; New Castle, N. S. W. 3060. Total. 21,566 tons. From Vancouver 120 sacks of anthracite were received. The market is very strong for Australian in all positions. The spot supply is about exhausted, while nearby arrivals are cared for. Labor troubles in Australia are against prompt shipments. English advices report free engagements, but they are distant arrivals. Wellington coal is hard to get.

Eastern Metal Markets.

By Telegraph.

NEW YORK, September 24.—The following are the closing prices the past week:

	Silver in Londn.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	.53½	1 16	$16 75	$5 07½	$23 25
Friday	.53⅜	1 15½	16 75	5 10	24 50
Saturday	.53½	1 15½	16 75	5 07½	24 50
Monday	.53	1 15	16 75	5 12½	25 00
Tuesday	.52	1 12¾	17 00	5 12½	25 10
Wednesday	.52	1 13	17 00	5 12½	23 00

NEW YORK, September 23.—Quicksilver is higher and strong at 78@80c. Borax is unchanged. Last Copper rates rule full. Consumers purchase up to about the usual wants. Some export demand is noted. Pig Lead better. After sales, 300 tons at $5.05; $5.07½ asked. Tin scarce and very firm.

Coal.

TO LOAD—PER TON		SPOT FROM YARD—PER TON.	
Australian	$ 8 00@$8 50	Wellington	$ 9 50
Liverpool St'm.	8 00@ 8 25	Greta	11 00
Scotch Splint.	8 25@ 8 50	Carbon Hill	7 50
Cardiff	8 50@— —	Nanaimo	9 50
Lehigh Lump.	16 50@17 00	Gilman	8 50
Cumberland hk	13 50@— —	Seattle	8 50
Egg, bard	15 00@— —	Coos Bay	8 50
CANADIAN ANTHRACITE COAL.		Cannel	12 00
Egg, ship side	$12 50	Egg, hard	16 00
Egg, yard	16 00	Cumberland, in sacks	16 00
Stove, yard	16 00	do, bulk	16 00
Nut, yard	16 00	Wallsend	10 00@10 50
		COKE.	
English, to load	$12 00@13 00		
English, spot, in bulk	13 50@15 00		

ON the Mokelumne river, in Calaveras county, there is a mine the ore of which goes $1 42 per ton. A German named Herman Trip is the owner, and has erected a mill on the property. Last month's run yielded him $1700. His expenses were $700, leaving him just $1000 clear profit. We do not believe there is another mine of low-grade ore in existence that can be worked so remuneratively.—*Union Democrat*.

Cement Kilns.

(*Concluded from page 199*)

Let Section 1 be loading and 2 unloading, the air for combustion goes in at the doors of Sections 1 and 2 and passes successively through Sections 3, 4, 5 and 6, which have been in heat to 7 and 8, the ones in which the fuel is being used; the heated gases pass from 7 and 8 on around through the sections until they reach 14, where they enter the flue to smoke chamber.

The air passing in doors 1 and 2 as it goes through Sections 3, 4, 5 and 6 takes up heat, cooling the burned material. By the time the air enters 7, it has become so heated that it will make a small bar of iron red hot. Sections 6 and 7 were in heat yesterday, 5 and 6 the day previous; to-morrow, in place of 7 and 8 being in heat, 8 and 9 will be, and 7 will be cooling; then the dampers between 14 and 1 will be opened and that between 1 and 2 closed; the valve in the smoke flue of 14 will be closed and that of 1 open; then Section 2 will be loading and 3 unloading.

The materials in Sections 9 and 10, the ones beyond those in which the fuel is being used, are in such a state of heat that the carbonic acid is nearly all expelled and ready to clinker, the next two are getting hot, the last two, 13 and 14, are drying.

The heated gases from the sections on fire give up their heat in passing through the unburned sections, so that when they enter the smoke chamber they are cooled below 160° F. The material to be burned is arranged in the sections something similar to a brick kiln. As will be seen in the sketch, there are 14 sections, one being burned each day, requiring 14 days to complete the circuit. Kilns on this plan can be made much smaller, having less and smaller sections.

There are other modes of burning, but the great cost of kiln precludes their general use.

Cements have also been burned with wood and coke, and there is no reason why wood alone could not be used.

Crude petroleum oils can also be used to burn cement, and are being used for that purpose in Pennsylvania. This fuel could not be applied successfully to the dome kiln, but could be applied to a Hoffman or ring kiln (shown in the engraving. Taken from the State Mineralogist's report), such a method being particularly applicable to the southern part of California.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, September 25, 1890.

ANTIMONY	— @ 21½
BORAX—Refined, in carload lots	8 @ —
Powdered " " "	8 @ —
Concentrated " " "	7½ @ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheathing	23 @ 25
Ingot, jobbing	20 @ —
do, wholesale	18 @ 18½
Fire Box Sheets	23 @ 25
LEAD—Pig	5½ @ —
Bar	5½ @ —
Sheet	7½ @ —
Pipe	6½ @ —
Shot, discount 10% on 500 bags Drop, ₩ bag.	1 75 @ —
Buck, ₩ bag	1 95 @ —
Chilled, do	2 15 @ —
QUICKSILVER—By the flask	56 00 @57 00
Flasks, new	— @ —
Flasks, old	45 @ 55
TINPLATE—B. Y., steel grade, 14x20, to arrive	— @ —
B. Y., steel grade, 14x20, spot	4 30 @ —
Charcoal, 14x20	6 75 @ 7 00
do roofing, 14x20	6 00 @ —
do, do, 20x28	12 00 @ —
Pig tin, spot, ₩ lb	23 @ —
CHROME IRON ORE, ₩ ton	10 00 @ —
IRON—Bar, base	3 @ 3½
Norway, base	4½ @ 5½
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½ @ —

IRON—Glengarnock ton	Spot.	To Load.
	34 00 @— —	30 @ —
Eglinton, ton	34 00 @— —	30 @ —
American Soft, No. 1, ton	— @32 00	32 @ —
Oregon Pig, ton	— @33 00	— @ —
Puget Sound	34 00 @— —	— @ —
Bar Iron (base price) ₩ lb	— @ —	— @ —
Clay Lane White	— @28 00	26 @ —
Sbotts, No. 1	34 00 @35 00	32½ @ —
Langloan	34 00 @— —	30 @ —
Thornclife	34 00 @— —	30 @ —
Gartsherrie	34 00 @— —	30 @ —
Barrow	34 00 @— —	30 @ —
Thomas	33 00 @— —	30 @ —
Cargofleet	30 00 @— —	26 @ —

Sales at San Francisco Stock Exchange.

THURSDAY, Sept. 25, 9:30 A.M.

500	Alpha Con	1.75	
130	Alta	1.20	
540	Andes	2.95@3.00	
250	Belcher	3.30@3.35	
10	Best & Belcher	3.75	
300	Bodie	1.60@1.65	
50	Bullion	2.80	
100	Caledonia	60c	
300	Challenge Con	3.00@3.10	
100	Con. Cal & Va	4.85	
100	Con. Imperial	45c	
200	Con. Pacific	20c	
100	Crown Point	3.00	
200	E. Sierra Nevada	10c	
300	Exchequer	1.25	
100	Gould & Curry	2.30	
150	Hale & Nor	2.45	
300	Hendricks	40c	
150	Iowa	50c	
50	Julia	35c	
100	Justice	1.55	
400	Lady Wash	65c	
250	Mexican	3.35@3.40	
575	Occidental	2.25@2.30	
100	Ophir	5.12½	
50	Overman	2.30	
100	Potosi	7.00	
200	Savage	3.95	
200	Seg. Belcher	1.60	
150	West Comstock	50c	
50	Yellow Jacket	3.45	

MINING SHAREHOLDERS' DIRECTORY.

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alki Cons M Co	California	1	1	Aug 23	Oct 3	Oct 22	B B Keeler, Flood Building
Alpha Cons M Co	Nevada	5	25	Sept 15	Oct 22	Nov 11	C E Elliott, 309 Montgomery St
A ta M Co	Nevada	39	50	Sept 1	Oct 7	Oct 29	L Osborn, 309 Montgomery St
Best & Belcher M Co	Nevada	47	25	Aug 21	Sept 25	Oct 17	L Osborn, 309 Montgomery St
Goleta M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
Gray Eagle M Co	California	19	6	Aug 25	Sept 29	Oct 20	J M Buffington, 303 California St
Guascaran & California M Co	Honduras	2	10	Aug 12	Sept 20	Oct 8	E Oliver, 22 Montgomery Ave
Gould & Curry S M Co	Nevada	65	30	Sept 16	Oct 21	Nov 13	A K Durbrow, 309 Montgomery St
Humboldt M & M Co	Nevada	1	1	Aug 16	Se t 29	Oct 25	J C Endicock, 35 New Montgomery St
Kentuck M Co	Nevada	22	30	Aug 18	Sept 22	Oct 14	J W Pew, 310 Pine St
Locomotive M Co	Arizona	3	5	Aug 13	Sept 18	Oct 6	A H Fish, 309 Montgomery St
Live Oak Drift Gravel M Co	California	12	5	Sept 3	Oct 9	Oct 31	J Morizio, 328 Montgomery St
Mayflower Gravel M Co	California	48	20	Aug 5	Sept 5	Sept 29	J Morizio, 328 Montgomery St
Mono G M Co	California	30	25	Sept 18	Oct 23	Dec 2	E L Burling, 309 Montgomery St
Montecito M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
Occidental Cons M Co	Nevada	7	28	Aug 5	Sept 11	Oct 7	A K Durbrow, 309 Montgomery St
Peer M Co	Arizona	9	10	Aug 7	Sept 12	Oct 3	N T Messer, 309 Montgomery St
Peerless M Co	Arizona	15	15	Aug 14	Sept 23	Oct 14	A Waterman, 309 Montgomery St
Sterling M Co	California	1	5	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
Silver King M Co	Arizona	4	30	Sept 20	Oct 25	Nov 18	Aug. Waterman, 325 Montgomery St
Teresa M Co	Mexico	2	5	Aug 13	Sept 18	Oct 8	A Cheminant, 328 Montgomery St
Utah Cons M Co	Nevada	10	25	Aug 5	Sept 15	Oct 2	A H Fish, 309 Montgomery St
Weldon M Co	Arizona	3	10	Sept 3	Oct 9	Oct 30	A Waterman, 369 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Gem M Co		A C Hammond	39 Merchants' Exchange	Annual	Oct 1
Golden Fleece G M Co	California	W J Gleason	306 Market St	Annual	Sept 30
Nevada Queen M Co	Nevada	E E Grayson	327 Pine St	Annual	Oct 8
Paradise Valley M Co	Nevada	A Cheminant	328 Montgomery St	Annual	Oct 8
Presidio M Co	Nevada	L Osborn	309 Montgomery St	Annual	Oct 6
San Joaquin Valley Coal M Co	Cal.	F Bonancina	428 California St	Annual	Oct 1

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Caledonia M O	Nevada	A S Cheminant	328 Montgomery St	03	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	April 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	305 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Sept 11

Mining Share Market.

Mining shares the past week exhibited continued strength for the higher-priced Comstocks, with, toward the close, a slight advance in Challenge, Confidence and Savage. Andes continued its erratic moves, allowing chippers fine opportunities of guessing the next move. Occidental acts as if it is being peddled out on the mill-starting-up proposition. The Alta group hang around at recent quotations. It looks as if the pool is concentrating them preparatory for an upward move soon, either before or soon after the Alta pumps are started up.

In outside stocks the Tuscaroras have shaded off under light trading. Central, Peerless and Crocker of the Quijotoas have a firm tone, The Bodies advanced sharply on Mono's assessment.

The market has an exceedingly healthy tone for an up move. Recent developments in the Hale and Norcross mine management are undoubtedly causing large capitalists who are reputed to be interested in the mines and mills, to look into affairs on the lode with the view of righting the wrongs that are firmly believed to be practiced in the working of the mine and milling of ores. At any rate, several of the mine superintendents' reports are improving, and now if they will follow the Overman's superintendent's reports and give the car sample assays as well as the battery assays, it will be a long step on the road to reform. With the mines worked in the interest of shareholders, we would soon have a mining stock boom, for a good class of buyers would undoubtedly come to the front as dealers.

The news from the Comstock mines grows more interesting. In Con. Virginia on the 800 level they have run west a distance of over 1200 feet from the old shaft and struck in the Andes ground the Red ledge, that this paper has persistently spoken of. The ledge is very rich in gold. There is a rumor that in Ophir on the 500-foot level they have found something in the west drift in that part of the mine known as the Burning Moscow ground lying north of West Con. Virginia. In Ophir on the 1300 and 1400 levels going west they have run into a very rich gold-bearing quartz or ledge farther west than before penetrated. The find on the 500 level is its upward continuation. In Mexican, very important work is under way. The Savage company has commenced taking out the rich ore on the 1300 level. Important prospecting work is being done in this mine, as is also being done in the Hale and Norcross. From Alpha and other Gold Hill mines important work is going on, and rich strikes are not at all unlikely to be reported any day. The work going on in the Ward shaft is being closely watched. The pump in Crown Point is being tested. It is probable that it will be accepted soon, when pumping out of the Gold Hill mines will be commenced. Several of the mines may be assessed to pay expenses, so say reports.

From the outside mines the news is about as heretofore published from the Tuscarora and Quijotoas districts. From the Bodies our news reports the streaks improving, and more encouragement is felt in finding a rich pocket. This news is confirmed in this city. The action of the stock also shows it.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none out worthy men.

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GEO. WILSON—Sacramento Co.
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W. J. HANCOCK—San Francisco.
SAMUEL CLIFF—San Luis Obispo Co.
W. W. TENOHALDE—San Bernardino, Cal.
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JOHN B. HILL—El Cajon, Cal.
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W. B. FROST—Placer and Nevada Cos.
WM. M. HILLEARY—Oregon.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.
A. S. ROBERTS—The Dalles, Oregon.
R. G. BAILEY—Washington.
H G. PARSONS—Arizona and New Mexico.

A YOUNG MINER named Fletcher Pratt was killed at the Keystone mine, Amador City, last week, by being caught by the skip, crushed, and then precipitated 100 feet down the shaft.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 4.		WEEK ENDING Sept. 11.		WEEK ENDING Sept. 18.		WEEK ENDING Sept. 25.	
Alpha	1.10	1.25	1.20	1 30	1.10	1.30	1.20	1.75
Alta	.90	1.15	1.05	1.15	1 10	1.35	1.15	1.30
Andes	1.10	2.35	1.10	1.35	1.20	2.25	2.05	2.35
Belcher	3.05	3.15	3.05	3.25	3.15	3.50	3.30	3 40
Best & Belcher	3.30	3.70	3.40	3.55	3.20	3.55	3.25	3.30
Bullion	2.35	2.75	2.50	2.75	2.70	2.85	2.75	2.85
Bodie Con	1.20	1.45	1.20	1.25	1.15	1.25	1.20	1.70
Bulwer	.25	....	.25	....	.30	....	.30	....
Commonwealth	3.00	3.10	3.00	....	2.75	....	2.75	....
Con. Va. & Cal	4.60	4.95	4.70	4 85	4.70	4.9	4.80	4.85
Challenge	2.20	2.35	2.75	2.70	2.50	2.70	2.60	2.80
Obollar	3.10	3.35	3.10	3.40	3.15	3.30	3 25	3.40
Confidence	5.37	....	6.50	6.60	6.00	..	6.75	7.50
Con. Imperial	.40	....	.35	.40	.35	.40	.40	.45
Caledonia	.45	.5	.40	.50	.50	.70	.50	.55
Crown Point	2.65	2.85	2.70	2.85	2.70	3.10	2.90	3 10
Crocker	.20	.25	.20	....	.25	.30	.30	....
Del Monte	1 20	....	....	....	1 10	....	1.00	....
Eureka Con	....	....	....	....	....	....	4.25	....
Exchequer	.95	1.00	.95	1.05	1.00	1.23	1.05	1.25
Grand Prize	.30	....	....	....	.35	....	.35	.40
Gould & Curry	2.15	2.45	2.25	2.30	2.10	2.35	2 15	2.25
Hale & Norcross	2.35	2.70	2.45	2.65	2.20	2.50	2.35	2.45
Julia	.25	.30	.30	.35	.30	.35	.35	..
Justice	1.40	....	1.45	....	1.40	1.60	1.50	1.55
Kentuck	1.15	1.50	1.30	1.55	1.35	1.60	1.70	1.90
Lady Wash	.45	.70	.50	.65	.60	.75	.65	.75
Mono	.50	.60	.55	.60	.50	.55	.40	.70
Mexican	3.05	3.45	3.15	3.35	3.15	3.30	3 20	3.30
Navajo	.40	.45	.30	.40	....	....	.45	.50
North Belle Isle	1.05	1.15	1.00	....	....	1.15	1.15	1.25
Nev. Queen	.90	....	.75	.80	.75	....	.85	.95
Occidental	.90	1.00	1.00	1.35	1.35	2.30	1.90	2.30
Ophir	4.75	5.25	4.85	5.12	4.85	5.0	4.90	5.25
Overman	2.15	2.25	1.15	2.25	2.20	2 45	2 20	2 31
Potosi	6.00	6 62	6.25	7.25	6.75	7.75	6.87	7.12
Peerless	.10	....	.10	....	.10	.30	.25	.30
Peer	.10	.15	.10	* .25	.25	.30	.25	....
Savage	3 65	4 2	3.75	3.90	3.55	3.90	3.50	3.80
S. B. & M	1.35	1.50	1 30	1.40	1.35	1.75	1.55	1.65
Sierra Nevada	2.30	2.90	2.75	2.85	2.75	2.95	2.85	3.00
Silver Hill	.30	.40	.35	....	.35	.45	.40	.45
Scorpion	.25	.30	.25	.30	.30	....	.30	....
Union Con	2.80	3.00	2.85	2.95	2.85	3.00	2 95	3.00
Utah	.75	.85	.75	1.05	1.0	1.25	1.10	1.20
Yellow Jacket	3.25	3.40	3.25	3.40	3.30	3.65	3.40	3.50

* Assessment de inquent.

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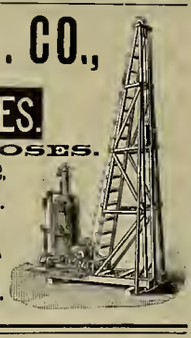

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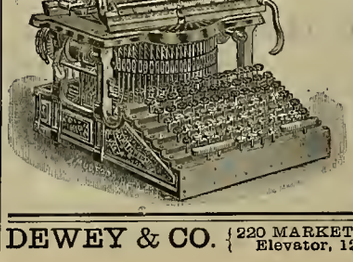

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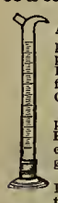

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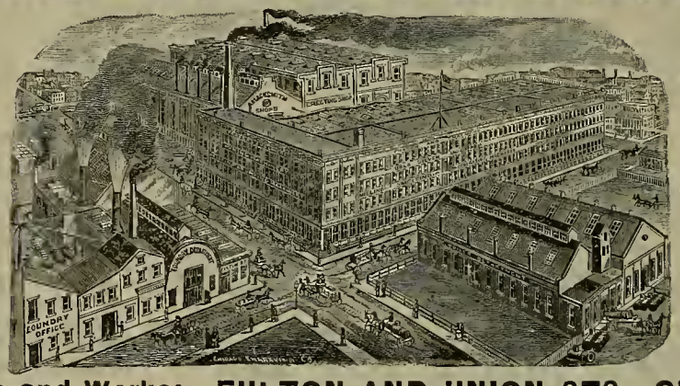

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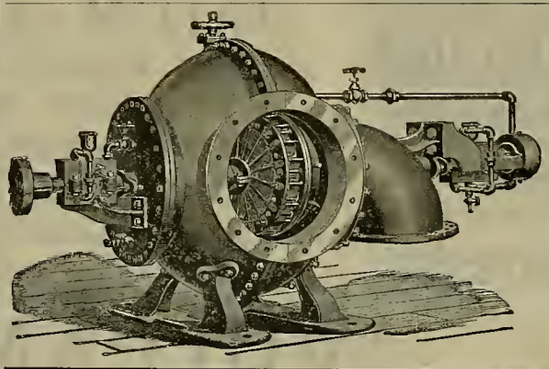

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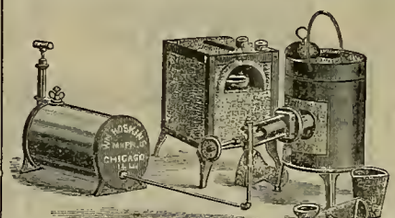

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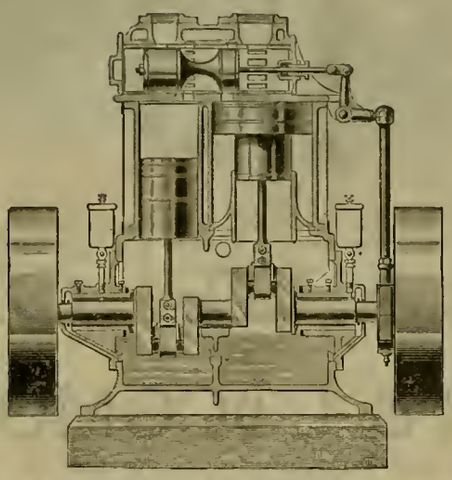

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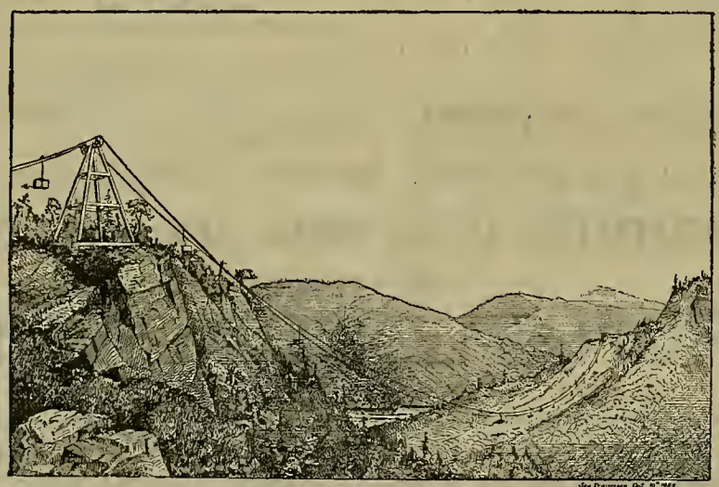

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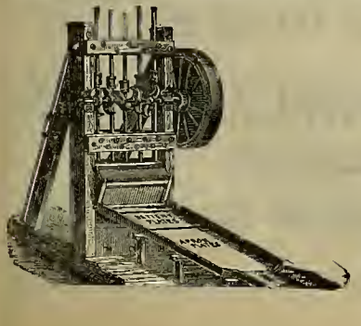

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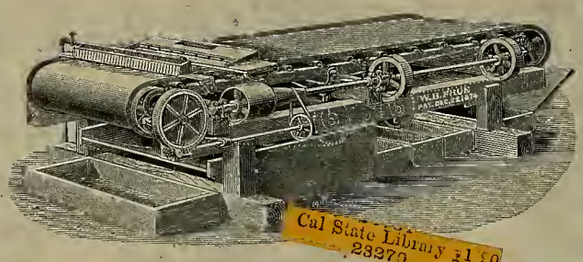

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RISDON IRON & LOCOMOTIVE WORKS,

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1 9x10 DOUBLE CYLINDER VERTICAL HOIST with Indicator, Cable, Cage and Cars.

FULL SET PUMPING GEARS, Bob and Connections, Pumps, Column Pipe, &c. Lot of Steel Rails.

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4 CHALLENGE FEEDERS.
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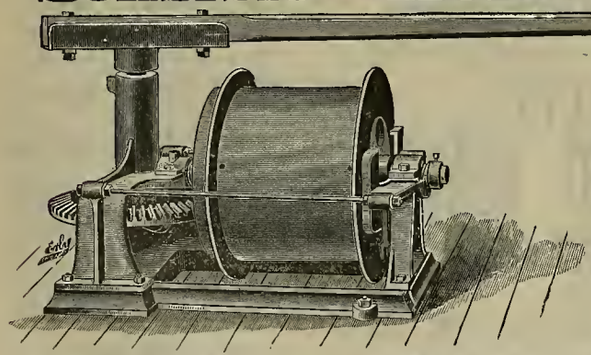
"Sensible" Horse Power Hoisting Whims.



These Hoisting Whims are built entirely of Iron and Steel, mounted on a heavy base plate, and, consequently, are very durable and cannot be affected by extremes of either cold or heat or climatic influences.

The hoisting drum is completely under the control of the person in charge of the hoisting or lowering through the shaft of the mine.

As the drum is entirely independent from the driving gears, the operations of hoisting, dumping bucket and lowering can be performed with the horse in constant motion, a feature not possessed by any other horse hoist in the market, and one that greatly increases their capacity by avoiding the loss of time due to stopping and starting the horse.

They are very light and compact, and can be packed for transportation by mules. Their cost of erection is very slight; two men, in half a day, being able to put one in place, ready for work.

With each Whim, working drawings are furnished, showing in detail the proper construction of Gallows Frame and foundation for Hoisting Whim.

We carry in stock the following sizes:

No. 1.—Capacity with One Horse and Single Line, 800 pounds, 75 Feet per Minute.

No. 2.—Capacity with One Horse and Single Line, 500 pounds, 125 Feet per Minute.

Weight of machine, 1200 pounds. Total shipping weight, including Sweep, Levers and Sheaves, 1400 pounds.

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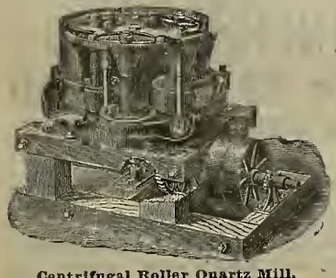
JOSHUA HENDY MACHINE WORKS,

NOS. 39 TO 51 FREMONT STREET, SAN FRANCISCO, CAL.



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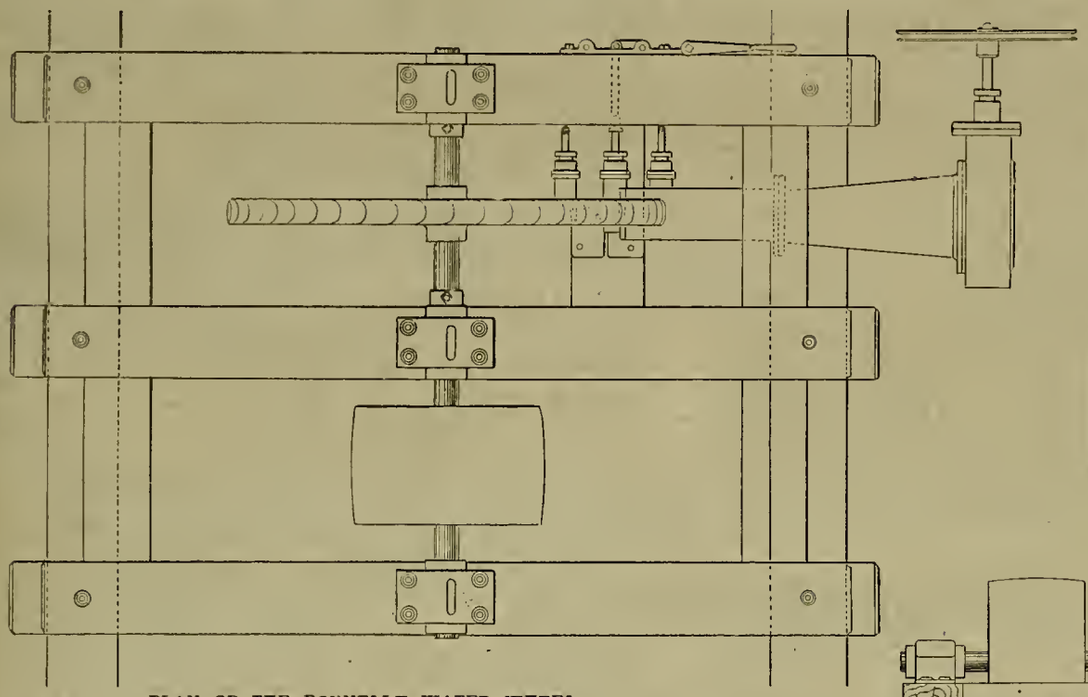
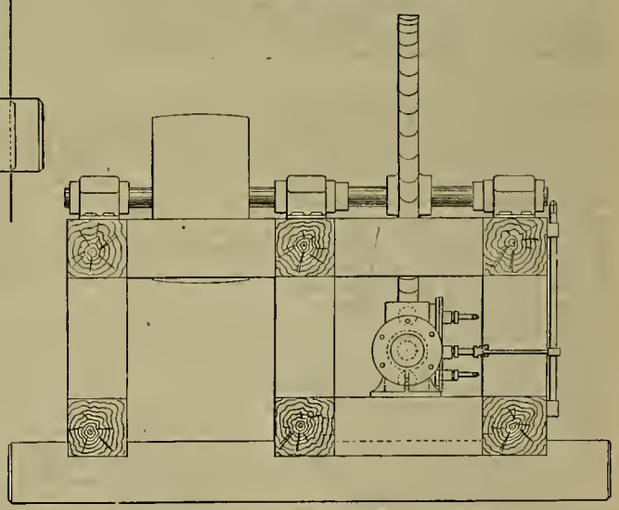


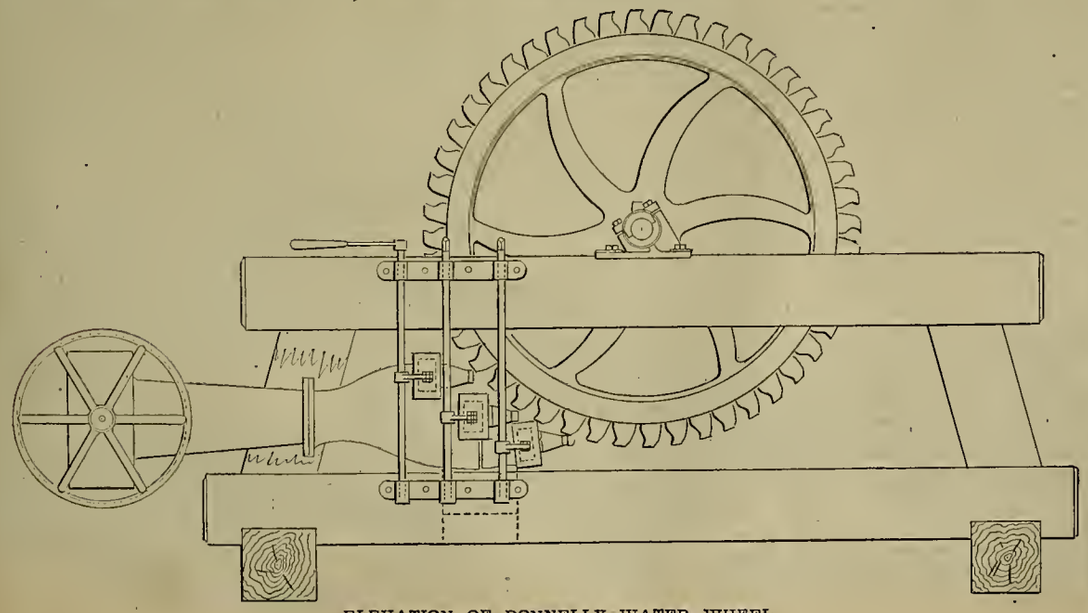
PLAN OF THE DONNELLY WATER WHEEL.

The Donnelly Wheel.

This wheel has its buckets riveted on to, and not cast, with the wheel, as is the case with the Knight. The jet of water impinging on the wheel is not split by a peculiar construction of bucket, but the Donnelly bucket has a very favorable shape for allowing a free discharge of water from the wheel as soon as the force due to the weight of the water has been imparted. The manner of the application of the water to the wheel, as well as the shape of the bucket, is one of the chief points of merit. The round nozzle is used in applying the water, instead of the elliptical or oblong nozzles which are best adapted to the peculiarity in the shape of the Knight bucket. During the last four years quite a number of these wheels have been called into requisition in the counties of Amador, Calaveras, El Dorado and Nevada, and have given satisfaction. A notable instance of the efficiency of these wheels is presented at Plymouth, Amador county, where one of them, under 561 feet of pressure, drives the 80 stamps of the Empire mill with 75 measured miners' inches of water. Another instance may be cited of the Seaton mill, near Drytown, containing 20 stamps driven by 42 inches of water applied to a Donnelly wheel, under 230 feet of pressure. These examples are given because circumstances allowed easy and exact measurement of the water. The Donnelly wheel, like the Knight and Pelton, belongs to the order of "hurdy-gurdy" tangential or pressure wheels.



END VIEW OF THE DONNELLY WHEEL.



ELEVATION OF DONNELLY WATER WHEEL.

The State Mining Bureau and the Legislature.

It is interesting to observe how our various California industries have, from small beginnings, been developed little by little until they have reached their present large proportions and obtained here a lasting foothold. It has been the policy of the State to aid these industries, not always at first, but accordingly as they have seemed to deserve it, private enterprise having first given them a start. In consonance with this policy, laws have from time to time been enacted in aid of agriculture, manufactures, viticulture, forestry, fisheries, land reclamation, irrigation, mining, etc., whereby there has come to be engrafted upon the Executive Department of the State a number of Commissions, Agencies, Bureaus and the like, mining having been among the last of these industries to be so taken under the fostering care of the commonwealth.

In view of the good work that the State Mining Bureau has accomplished since its creation, public sentiment would seem to favor a continuance of the support now being extended to it by law. That the mining community will expect this much at the hands of the incoming Legislature is certain, the several reports prepared by the State Mineralogist having proved so helpful to that class that it can hardly be supposed they will willingly forego these benefits in the future. The hardy toilers in the mountains feel that they are entitled to share with the rest of our citizens the bounty of the State, the more so in that this bounty, postponed to a very late day, has since been dealt out but grudgingly.

CEMENT FROM A NEW QUARTER.—Two hundred barrels of cement, manufactured at San Diego from the deposit of raw material at that place, were received at the port of San Francisco last week.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—Eds.

Comstock Superintendents' Salaries.

Editors Press:—The *Territorial Enterprise* in a recent issue indulges in a few sarcastic remarks about the "blear-eyed crew of Pine street," which they say annoys the mining superintendents of the Comstock by its importunities for anything from a quarter of a dollar to five dollars. It's an ill-natured brute that growls at the hand that feeds it, and this, from the apparently official organ of these gentlemen, comes with bad grace. Upon investigation, we find that the following salaries are paid each month to some of these mining superintendents:

S. L. Jones—		
Crown Point	$500 00	
Belcher	500 00	$1,000 00
W. E. Sharon—		
Union Mill & Mining Co. (est'ted)	$500 00	
Confidence	250 00	
Challenge	250 00	
Yellow Jacket (estimated)	500 00	
Con. Imperial (estimated)	500 00	$1,250 00
A. C. Hamilton—		
Chollar	$250 00	
Potosi	250 00	$500 00
R. P. Keating—		
Hale and Norcross	$400 00	
Savage	400 00	
Scorpion	150 00	$950 00
P. Kerwin—		
Best and Belcher	$250 00	
Gould and Curry	250 00	$500 00
D. B. Lyman—		
Con. Cal. and Va	$187 50	
Mexican	187 50	
Ophir	187 50	
Occidental	150 00	
Sierra Nevada	200 00	
Union	125 00	$1,087 50

As none of these properties are paying dividends and but few of them paying expenses, it can be seen that assessments paid by the "blear-eyed crew of Pine street" are furnishing the funds that enable these worthy superintendents to receive salaries large enough to permit them Palace-hotel luxuries, two-bit cigars and "shampagny" water, while the "blear-eyed crew" rustle for beans and cold potatoes. In view of these facts, it is certainly unkind of these well-paid gentlemen to complain when one of their patient constituents and supporters, temporarily discommoded by assessments levied to extract $300 rock, extends his or her hand for just sufficient to bridge over a few days on cold potatoes.

Perhaps it is wrong to ask these hard-worked corporation servants to share their petty stipends with the "blear-eyed crew." The intense application with which some of them devote themselves to their duty is evidenced by the registers of the Palace hotel at San Francisco and the leading watering-places on the coast. Clad in stylish apparel, with the cooling breezes of the Pacific fanning their manly brows, wrinkled with the care of taking out porphyry bowlders that assay $2461 per ton, or in devising ways to help the poor miner by mixing and reducing $477 ore, so that he and the "blear-eyed crew of Pine street" may pay assessments to take it out, they are entitled to the commiseration and sympathy of every right-thinking person. We are very sure that if the "blear-eyed crew" had ever known how badly these poor superintendents were abused, they would have long ago stopped paying assessments and permitted them to get back where they belong and strike a drill with the same efficiency they have shown in the past.

Mining Stock Association,
J. H. Tingman, Vice-President.

Notes from Arizona.

Editors Press:—The O. K. Mining and Milling Co., near Hackberry, Mohave Co., have their mill in condition so that it will soon be crushing ore. The property is under the management of Frank Welsh, who informs your correspondent that the outlook for his company is splendid.

Kingman, Mohave Co., Arizona, is an important mining center. There are two companies having sampling works at this place, one owned by Lake & Smith and the other known as the Arizona Sampling Works, of which Jno. Lynch is manager and principal owner. Mr. Lynch draws his samples from a radius of 100 miles, but mainly within a circuit of 10 to 40 miles. The mining interests of Stockton Hill, Mineral Park, Hackberry, Arizona, and as far westward as Daggett, Cal., concentrate at Kingman. It is on the line of the A. & P. R. R. and has important commercial as well as mining interests. The Taggart Mercantile Co. and Beecher & Co. do an extensive business. Kingman is certainly a promising camp. P.

A Bruckner Furnace Lining.

Editors Press:—Noticing the article in your paper, some two weeks ago, in regard to the Bruckner furnace, and that it had to be lined with firebrick, I would say, in connection therewith, that there is a Bruckner furnace in a silver mill in this district in which there has already been roasted over 2000 tons of ores, and the lining of the furnace is as good as when first put in. This furnace was lined with adobes made out of a peculiar yellowish clay that is found here, and mill tailings mixed in.

The process of making the adobes was as follows: First, the clay was screened to clean it from gravel, and then was thoroughly ground and mixed with tailings in an adobe mill, then molded and well dried in the sun.

The furnace was then lined with the dry adobes and set in with the clay mud. The furnace lining was then plastered with a mixture of clay and salt, and was then allowed to dry. After getting thoroughly dry, a low fire was built in the furnace and salt thrown in and allowed to roast, and the furnace is then ready for use. Care has to be taken in discharging the roasted ores and not pull out the lining with the iron rakes. The better plan is to open the discharge-gate and let the furnace revolve and discharge itself.

This furnace lining will last as long as firebrick, and can be put in at less than one-fourth the cost of firebrick, where freights are high.

Bernice, Nev. G.

Mines of Sonora, Mexico.

Editors Press:—The rainy season in Sonora set in with a violent tempest July 26th and continued in full force till this date. For 25 years, or since the French Intervention, the inhabitants say there has been no parallel. High water has continued all the time; roads and fields are washed away. The Sonora railway as well as the A. & N. Mexico had its line torn out and traffic was suspended for nearly a month. In the interior of the State, mails did not arrive for weeks at a time; to mining industry it was disastrous, but will in the end result in lasting benefit.

Most of the mines and mills suspended for want of proper supplies; the Prietas Co., Torres Station; also the mill belonging to Chamberlain & Price. The latter company, for a long time paralyzed for want of water, has recently started on full time, and it is said is doing remarkably well.

The Prietas Co. are introducing a new process so that they may successfully treat the rebellious ores of the Grand Central mine. It is said that several new companies are about to initiate work preparatory to erecting mills in this district. The Yeso mine of Fresh and Magruder was suspended about 15 days by the rains and had several buildings unroofed by the wind, including part of the mill. Their ore is said to be improving very much as they develop the new works in La Gloria mine. It is to be hoped that the owners of this property may reap the reward their constant perseverance in the past under discouraging circumstances merits.

The Gavilan property, on which the mill has run intermittently for about a year, is said to be a good one. At first there was difficulty in treating the ore, owing to the inefficiency or ignorance of the millman. This difficulty was overcome later, and it was found that the ore was free amalgamating. The company own three mines, all situated on the same vein, the greater part of the ground being undeveloped and unprospected. If the company had a more liberal amount of capital they could make a much better showing.

It is reported that parties are negotiating with a view of acquiring the property, forming an incorporated company, and thus, with additional working capital, prosecuting the work actively. The property is good and the 10-stamp mill is substantially new and runs well. The situation is all that can be desired.

The Las Delicias property is at a standstill as far as the mill is concerned. The mine is being developed, a process it needed very much, as it was in an unopened state. It has been up to now impossible to treat the ores up to a high percentage. The new owners claim they have a "beneficio" which attains the much-desired and long-sought percentage; if this be true, the property is a good one, as the ore supply is apparently boundless.

The Oro Negro Co. near Arizpe is said to be doing well. Their mines are described as very rich and large in extent. The mill and roasters are fine pieces of work. No expense has been spared to make things good and well arranged.

The Milford Gold Mine Co. is not moving their Wiswell mill. It is said that a new company is about to erect a stamp-mill at the mine.

Hermosillo, Sept 17, 1890. Anon.

Silver King, Arizona.—A correspondent writes us as follows: Nothing going on here in the way of mining outside of the Silver King, and they are doing no good, only working a handful of men. They are now sinking the hilk shaft which is west of the King. I am informed that they will sink this shaft 1400 feet from surface, which I think is folly. They have not found any ore in this shaft and I am of the opinion that they will not find any, no matter how deep they sink it—that is, Silver King ore—but should they go back to the 900 and 800 foot levels and prospect the ground east of the "old" King shaft, from those points I believe they would find the Silver King mine. Although silver is up to a good price, still there is no effort being made by companies owning property here as yet to do development work.

One of the largest iron mines in the known world is a lead or a strata of magnetic iron ore near Neihart, Montana, that is 20 feet in width and crops out of the ground for a distance of 9000 feet.

Steam Plowing at the State Fair.

[Written for the Press.]

The exhibition of traction engines at the State Fair this year attracted great attention and was one of the leading features of the mechanical department. Two of them were shown each evening under steam in the pavilion, and were nearly always surrounded by a crowd of solid-looking men from all parts of the coast, who examined them with the closest scrutiny. An exhibition of their capacity for plowing was given at Coyle's ranch, about three miles from town, on the forenoons of Tuesday, Wednesday and Thursday of the last week of the fair. Notwithstanding the distance from town and the lack of public conveyance, there were hundreds present each day and the interest manifested showed a realization of the fact that steam is about to supplant animal-power to a large extent for farming and freighting on this coast in the near future.

The machines that took part in the exhibition of plowing were the following:

1st. The "Pathfinder," weight 13 tons, pulling 12 ten-inch plows divided into three gangs of four plows each, the gangs being attached to the machine by three chains supported by a sort of cart.

2d. The "Native Son," weight seven tons, pulling eight ten-inch plows (two gangs of four plows) attached to the engine by chains like those on the Pathfinder.

Both the above were made and exhibited by Daniel Best of San Leandro.

3d. The Jacob Price field locomotive, made by Jacob Price of San Leandro, Cal., and Racine, Wisconsin; weight, 8½ tons, pulling twelve 11-inch plows which were attached to a light triangular platform from which the gang levers were operated. The 12 plows were divided into four gangs of three plows each.

4th. The Baker & Hamilton engine made by the Benicia Agricultural Works; weight, 13 tons, carrying twelve 12 inch plows attached to a very elaborate and powerful frame having a device for raising and lowering the plows by steam.

The ground selected was a sort of yellow cement very hard and dry, having had no rain or other moisture upon it for nearly four months. The universal opinion before operations commenced was that no plowing could be done because of the hardness of the ground; but all the machines set to work at once, and by putting men on the gangs, made them take hold, ripping the ground up in great lumpy billows instead of furrows. Each machine went a round or so in a sort of go-as-you-please manner, but doing the work successfully; and 1 o'clock having arrived, the crowd left for town, thus ending the first day.

The second day the machines were required by the committee to go three rounds each (about 2½ miles) without stopping and to maintain, if possible, their steam pressure and to have as much water in the boiler at the end of the three rounds as when starting.

This was successfully done by the Best and Price machines, and would probably have been done by the Baker & Hamilton machine but for an accident that disabled it.

The third day was devoted to a further trial with the Baker & Hamilton machine, which again became disabled, and wound up with a sort of foot-race between the Pathfinder and the Price machines, the latter making a round of nearly a mile, with its 12 plows, in 10½ minutes. The Pathfinder tore away from the starting-point with a speed that would have taken it around in even less time had a plow not broken from its fastenings and plunged into the ground so deeply the whole outfit was brought to a standstill when about three-fourths of the trip was made.

This ended the exhibition, which was pronounced by all as being simply wonderful, one enthusiastic committeeman saying that if he could have his way he would give each machine a gold medal as big as a dinner-plate, for showing so conclusively that steam plowing is practicable.

The farmers present estimated that it would have required from 50 to 75 good horses to have pulled, even slowly, either system of 12 plows that were so rapidly and easily drawn by the different engines. The contest between the Price machine and the larger one of Best's was very close, as will be seen from the following

Report of the Committee:

We, your Committee on Traction Engines, respectfully report as follows: After a careful examination of the several traction engines, we award the premium to the one called "The Pathfinder," manufactured by Daniel Best of San Leandro.

The engine manufactured and exhibited by Jacob Price of San Leandro deserves special mention, being a close rival to the Pathfinder. So nearly equal are the two engines that the committee had great difficulty in deciding which was the better. In evidence of which, the committee on the final ballot stood three for the Price and four for the Best ("The Pathfinder").

The Benicia Engine, manufactured by the Benicia Agricultural Works, is also entitled to great praise. It possesses many fine features, and for heavy work, simplicity of construction and economy of fuel, was the peer of any in the contest; but, unfortunately, it became disabled early in the contest, which virtually precluded it from further competition.

J. J. Skinner, S. L. Gaines,
Jos. Enright, D. C. Mattison,
Wm Kelly, S. B. Adams,
C. C. Agee, Committee.

The Pig-Iron Industry.

The Census Office has issued a bulletin showing the production of pig iron in the United States for the year ending June 30, 1890. Great credit is due Dr. William M. Sweet of Philadelphia for this magnificent achievement in statistical work. The following points condensed from the report will no doubt be read with interest:

The production of pig iron for the census year of 1890 was the largest in the history of the iron industry in this country, amounting to 9,579 779 tons of 2000 pounds, as compared with 3,781,021 tons produced during the census year 1880, and 2,052 821 tons during the census year 1870.

From 1870 to 1880 the increase in production amounted to 1,728 200 tons, or nearly 85 per cent, while from 1880 to 1890 the increase was 5,798,758 tons, or over 153 per cent.

The pig-iron industry of New England has been practically stationary during the last 20 years.

Pig iron is now made in 25 States and Territories.

Pennsylvania produces about one-half of all the pig iron made in the United States.

Ohio retains second place, dropping, however, from 14 per cent in 1880 to 13 per cent in 1890.

Alabama advances from tenth place in 1880 to third place in 1890. Her increase over 1880 is 1328 per cent.

Illinois, which was seventh in rank in 1880, is fourth in 1890.

New York retires from third to fifth place. Virginia advances from seventeenth to sixth, and Tennessee from thirteenth to seventh.

As showing the greater size and capacity of furnaces in 1890 over those of 1880, the fact is demonstrated that, while the production of 1890 was 5,798,758 tons greater than that of 1880, the number of completed furnaces actually decreased from 681 in 1880 to 562 in 1890. In other words, the average yearly capacity in 1880 was 5552 tons, while the average yearly capacity of furnaces reported in 1890 was 17,046 tons.

The nine Southern States produced only 350,436 tons in the census year 1880. In 1890 they produced 1,780,909 tons, an increase of 408 per cent.

Kentucky alone, of all the Southern States, shows a decrease in production amounting to 25 per cent.

Six Western States, Illinois, Indiana, Michigan, Missouri, Ohio and Wisconsin, produced in 1890 2,522,351 tons, against 995,335 tons in 1880, an increase of 153 per cent. Indiana, alone of these States, reports a falling off, amounting to 37 per cent.

During the decade, the use of anthracite has fallen off 71 per cent, while the use of mixed anthracite coal and coke has increased 163 per cent; coke and bituminous coal, 343 per cent; charcoal, 51 per cent; and castings direct from furnace, 135 per cent.

Of Ohio's product in 1879, viz., 1 302 299 tons, the Mahoning Valley produced 527,164 tons, or nearly half.

The production of Bessemer pig iron in the United States during the census year 1890 amounted to 4,233,272 tons, of which Pennsylvania made 2 567,813 tons; Illinois, 616,654 tons; Ohio, 516 654 tons; and other States much smaller quantities.

One hundred and forty-nine thousand nine hundred and fifty-nine tons of spiegeleisen were produced in the census year 1890.

Prospects Not Worked.—There is a better feeling for the future prosperity of Crested Butte than for a long time. The prospects of railroad building and the opening of the marble industry are very encouraging, to say nothing of the improvement of the silver mines by the summer development. Then again, the advance in the price of lead and silver has kindled more hope and a better feeling within the breast of the ever-hopeful miner. It is a remarkable fact, however, that notwithstanding strenuous efforts have been made to make mining sales, very few, if any, have been made. Capitalists and experts come in and look around, then go out without buying. Why it is we cannot account for. We know that prices are not unreasonable, at least in most ones. It is true there are a few who are afraid to put a price on their property, and should any one approach them to purchase they will not sell for fear they will not ask all that they might possibly get from some other source. We expect we could name 50 mines tributary to Crested Butte that could be producing, paying mines if they were only owned by persons who would work them as such. The most of these properties have got to change hands before they will ever amount to anything, and the sooner they do the better it will be for the country.—*Elk Mt. (Col.) Pilot.*

Says the Grass Valley *Telegraph:* The old Allison Ranch mine stands out gloomy and unworked, with a splendid history and with millions in the ledge that is not very deep under the ground. The Allison Ranch mine ought to join the splendid procession of Grass Valley old mines that are being reworked. But the Allison Ranch mine is owned by men who have all the money they want.

The steam-power of the world has more than doubled in the last 15 years.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XIII.

[Written for the Press by James H. Crookman.]

Slover Mountain Marble and Lime.

Slover mountain is an isolated butte situated in Township 1 South, Range 5 West, San Bernardinn meridian, three-quarters of a mile in a southwesterly direction from Colton. It is 977 feet above the level of the sea, and its greatest elevation is only 700 feet above the plain in which it occurs. Its dimensions from base to base are 3900 by 2600 feet, covering a superficial area of 10,146,000 square feet.

This mountain, though unimportant in dimensions, contains an immense storehouse of mineral wealth, and as a producer it can hut add largely to the prosperity of San Bernardino county.

The mountain as an entirety is owned and operated by tha California Marble and Building Stone Company, whose principal place of business is at Colton—V. P. Dyer, Esq., superintendent, with a branch or distributing office at 42 Flood Building, San Francisco—Jno. C. Pelton, Esq, manager. It is an incorporated company, capitalized in the snm of $500,000. The qoarry is under the sole control and management of Superintendent Dyer, who has had 40 years' experience in some of the most notable marble quarries in both Europe and America.

Geology.

Geologically speaking, Slover monntain, though ae a whole, to nse a conventional phrase, composed of limestone, is composite in character, ae its mineralogical make-up is dissimilar. The divielon lines between the different forms of calcareous stones are sharply drawn from north to south through its center, at right angles with its greateet longitudinal extent, which is easterly and weeterly. The eastern portion contains both carbon and magnesia, the first forming a carbonate of lime (marble), and the second magneeian limestone, dolomite, aragonite or onyx. The weeterly half is exceptionally a limestone of unnsnal purity, containing hut five per cent of foreign matter when calcined and extraneous matter expelled by heat.

In this form it is a commercial product which is in demand from its remarkable purity and brilliant whiteness, commanding a good price in all portions of Southern California.

The stratification of the mountain is easterly and westerly, dipping southerly at an angle of 20 degrees.

The first product of the marble varieties is a carbonate of lime. It is of a fine crystallization (color both a pure white and of a pearly hue), suitable for structural or etatnary purposes. The chisel gives clean-cut and sharp lines. The second (magnesian limestone), though a marble, is eo peculiar in textnre that it has not a counterpart in any of the known quarries of the world. It is crystalline in structure and homogeneous in character. Its crystals are semi-transparent, firmly held and cemented each to the other by a magnesian paste, forming a solid and impermeable mass. In color it variee from a jet black to a pearly white, from a gray to a brown, and also variegated red, yellow and green, the colors harmoniously blended. They occnr in bands, veins and streaks. There ie seen a mottled black and white, then an indescribable combination of colore, as if an artist had "pied" his palate into a common receptacle of fluid which had congealed without order or system. The lighter-colored marblee are semi-traneparent (traneleent), so much so that if cnt into thin slabs any opaque substance held between it and the sun will cast a shade similar to fine porcelain.

This quarry, though in its infancy and its product but little known, is rapidly growing in reputation, and the stone is in demand both for structural and ornamental purposes.

The Marblee

Are susceptible of an unusually high polish. Their luster is so great that the observer would think that they were inoloced in and covered by a glass plate. Atmospheric influencee, ink or citric acid do not affect them or change their color. Their intrinsic valne ie one-third greater than the imported Italian, and they can be laid down in the marts of the world at a far less price. The coloring matter of the stone consists of graphite and the oxides of other mineral products. Graphite exiete in thin veins, but not in sufficient quantities to warrant its extraction as a commercial product.

The Marble-bearing Portion

Of Slover mountain is situated on its northeasterly borders, and to all appearances ie inexhaustible. It lies in strata of considerable thickness. Development as the work progresses constantly expose new and intereeting varieties of stone. It is impossible to predict the future of this wonderful deposit.

Prof. A. W. Jackson of the University of California has made a number of analytical tests of the several varieties of the stone of this quarry, and reports that the greater portion of each variety which he teeted should be classified as a carbonate of lime, as the amonnt of magneeia present was so small that it did not justify classifying it as a magnesian limestone, technically known as dolomite.

Development.

The floor of the quarry which constitutes the main workings is situated 45 feet above the level on which the mill is situated. It is 500 feet in length by 30 feet high, and is rapidly increasing in hight as the work is extended. The hill has a slope of 28 degreee. During the writer's visit a block was quarried from the face of the works which measured 15x27x7 feet, and showed no flaws nor cracks.

Several small quarries have been opened at a greater elevation in order to test the extent, variety and quality of the marble. The highest point reached is 525 feet above tha base.

Plant.

At the time of the writer's examination, the mill consisted of three gangs of saws of the capacity of 48,000 superficial feet per month. There is also one rubbing bed, one polishing machine, turning lathe, molding machine, slab machine driven by a 75 (high pressure) horse-power engine, with a supplemental 25-horse power engine to move the stone from the quarry to the mill. This mill has been so heavily taxed with an accumulation of orders from public and private buildings in San Francisco and elsewhere that I am informed it has been necessary to treble its capacity. Nine gangs of saws are now in operation, and preparations are being made for a much larger increase. Mr. Warren T. Kimball is now en route to Europe in order to ascertain the most desirable class of machinery for that purpose. The new additional plant will cost about $30,000.

There are about 1000 tons of marble ready at the quarry for shipment. On the writer's visit, a block of marble that had just been broken from the quarry measured 27 feet long by 15 feet wide by 7 feet in thickness, showing neither crack nor flaw.

The company is making preparations to ship to San Diego from five to ten carloads per day—each car to carry a solid block of 20 tons.

Both the Southern Pacific railroad and the Santa Fe system pass under the sheds of the quarry, affording unexceptionable transportation facilities for the product to all of the markets on the continent, both east and west. Fifty men are employed in quarry and mill, and the highest prices are paid for skilled labor.

Lime.

An extensive quarry has been opened on the southwesterly flanks of Slover mountain for the purpose of extracting this stone for its product, the lime of commerce. Its length is 100 feet and hight 600 feet.

The plant consists of four patent kilns with all the modern improvements. Two of them are respectively 33 and 45 feet in hight. The first produces 75 barrels and the latter 100 barrels commercial lime daily. Two are circular, 42 feet in hight, covered by iron sheds; capacity 45 barrels each, making an aggregate production of 265 barrels per day.

Eleven cords of wood are used daily. The company has erected at the works a barrel manufactory. The wood for this purpose is transported by water and team for a distance of 21 miles from the San Bernardino range of mountains. Lime is sold at the works at $1.20 per barrel, exclusive of the barrel, for which a further charge of 25 cents is made.

(To be Continued.)

The Gold Belt of California.

Ancient River Channels and Gravel Deposits.

NUMBER III.

[Written for the Mining and Scientific Press by Stephen Barton of Kernville, Cal.]

The discussion of the form of crystallization and the fineness of gold, as a prime object of inquiry, would be aside from the purpose of these articles, and they are only referred to as auxiliary to the question as to where the gold came from. Though the gravel of the ancient, lava-capped hills is nearly all quartz, enough is discernible to enable us to determine that in many cases it came from lodes formed between slate walls. Greenstone, hornblende, slate and mica slate are associated with most of these deposits, hnt the levity of the latter generally leaves it on top. At Fairplay Hill, in the south part of El Dorado county, I have seen very heavy little chestnut-brown pebbles the size of beans, probably oxide of tin. These would be deep down in the fissures and were a sure criterion of a prospect of from 50 cents to $1 to the pan. A man might work all day, however, without getting more than five pans showing the pebbles. At this point there was more evidence of great force of current than any place I have seen in these ancient deposits.

First the current had concentrated in a groove in the bedrock sloping to the south; at the bottom of this groove it had struck a detached piece of granite some ten feet in diameter and had bored a round hole entirely through it some five feet in diameter. The polish on these water-worn surfaces was as hard as glass, notwithstanding that the mass could be broken into fragments and pounded into sand with the side of the pick. The hard polish seemed to be no thicker, however, than an egg shell. At this point, as well as at a point west of Columbia, Tuolumne county, I noticed heavy deposits of water-worn pebbles of lava. At the latter place a hill composed of this form of deposit rises more than 100 feet above the great stream of basaltic lava which forms Table mountain. I have said that it seems to me that there had been two periods of volcanic activity on the Pacific Coast, and I believe this basalt was erupted after the rivers had cut channels 200 feet deep among the lava-capped hills. Since basaltic columns are rather rare in California, I will digress enough to say that six-sided columns 100 feet high, standing perpendicular, may be seen overlooking the Stanislaus, three miles northwest of Columbia.

While on the subject of deposits of different ages, I will say that on the bluffs of the Tuolumne, below the mouth of the South Fork, there is a gravel deposit some 2000 feet above the bed of the adjacent stream, and not more than 300 feet below the grade of the oldest gravel deposits. This deposit corresponds with the grade of what is called Big Gap, in the dividing ridge between the Tuolumne and Merced. In following this grade and turning to the south for three miles we trace this ancient channel among the bluffs of the headwaters of the North Fork of the Merced. At La Grange on the Tuolumne, we are presented with a series of channels of different ages, one bench rising above another in regular terraces, so that the Tuolumne alone presents us a whole volume of past geological history, without a chapter missing, from the Miocene down to the very present.

I have often said to myself, what a fund of information Prof. Whitney could have given the mining world while paid to thread these deep solitudes, if he could only have brought his mind for a moiety of the time to abstain from dilating upon the wonders of the insect world. Eugology is all very good in its place, and doubtless there is money in it, but it is sadly out of place in a mining community. As it is, our most trustworthy information in regard to the mining region is obtained from men who made their observations with a roll of blankets and sack of flour on their backs.

I have spoken of a Pliocene deposit at the mouth of Kern river canyon and running thence to White river, along the edge of the Tulare valley. There are a few places where auriferous gravels have been worked beneath this cretaceous deposit, and I think it may yet develop mines of some value; hnt the depth of the chalk, the rapid dip of the bedrock beneath the valley and the great difficulty in obtaining a water supply prevent it from becoming the site of an extended industry.

We thus see that by beginning with the oldest forms of gravel deposit we are able to descend by one unbroken series of events to the present, with a retiring ocean constantly before us, and the channels of our rivers constantly growing deeper. This change was not limited to this side of the mountains. At the beginning of the era of ancient-gravel deposit, the evidence is that the Great Basin was an immense inland sea rising to the ancient beach above Salt Lake City; that this sea received the drainage of a vast region now outturning through the Columbia; and that a powerful stream descended through Owens River valley and reached the Colorado east of Mt. San Bernardino, leaving also a Miocene deposit west of that mountain several hundred feet above the sea.

There is no use of trying to theorize away from the facts. One stubborn fact is worth a thousand theories which are not known to have a foundation. I have mentioned the finding of a conch shell in the ancient gravels of Tuolumne. It was in the possession of a miner by the name of John Glass and was found by him near Columbia. I had forgotten that he also had the shell of a cardium or salt-water clam found there of apparently the same species now found on Long Island. This shell was, however, very much petrified and had endured the ravages of time too much for its species to be certainly and accurately determined. I had also forgotten to mention that while I was mining at Columbia, two skeletons, supposed to be human, were unearthed in the Stanahan tunnel in Table mountain, and that they were given in charge of the Geological Society of Sonora. To this I must add that John Huntley, Federal internal revenue collector after the war, found a number of shark's teeth in the chalk hills north of Kern river. Hence we see that in the ancient gravels there was a mingling of land and salt-water fossils. The sea was constantly surrendering to the land.

Back of the Miocene there seems to be a tremendous gap in the geological history of the western slope of the Sierra Nevada range. The only fossils I have met with in the older formations were at Mineral King, in Tulare county, and they were probably referable to the Silurian, or at latest not later than the Clinton sandstone. Still it has been claimed that the westernmost or main gold belt was of formations referable to the age of the Jura rocks. I have failed to see a single fossil from them.

(To be Continued)

ROUND VALLEY COAL MINES.—There is much excitement in Round Valley, Mendocino county, over the coal mines. The Bank of Nevada owns 100,000 acres of coal lands near the junction of the two forks of Eel river. They have let it lay for years untouched, hnt are now spending $15,000 in prospecting it. A tunnel was run into the bed where there were some croppings close to the Middle Fork. At first the bed lay at an incline of 45 degrees, but as the tunnel ran in the slant decreased to 20 degrees. The bed varies in thickness from 8 to 14 feet, and has improved in quality as the tunnel went down. At 140 feet, water stopped the work. Pumps have been sent for. In the meantime work is being prosecuted on another tunnel across the river. The coal is pronounced an excellent article for use on railroads and steamboats. Mr. Flood of the Nevada Bank states that the Fort Bragg R. R. Co. will build into Sherwood valley, where they will be met by the owners of tha mines. It is the nearest outlet, and would greatly help the people of the Northern valleys. We sincerely hope it will prove to be more than an empty promise. The people of Round Valley are greatly elated over the prospects. Coal croppings are found along the range west of Round Valley for 20 or 30 miles to the north of the property of the Nevada Bank.—*Ukiah Press.*

Tin.

Tin Ore and What Appears Like It.

We republish, as follows, part of an article written for this journal some years ago by Melville Attwood, Esq., of this city, in view of the increasing interest in tin in this country:

In submitting to our readers this short notice on tin ore, it is perhaps desirable to make some preliminary remarks, and to state that our object is, if possible, to give the prospector searching for such ore a few plain directions, so as to enable him, without much trouble, to distinguish that ore from what appears like it, and also to point out tha character of the rocks in which it is generally met with, and thereby save the prospector a needless expenditure of time and money in looking for that ore in places where it is not to be found.

Tin stone or ore occurs disseminated in the ancient rocks, particularly granite; also in beds and veins, in large irregular masses called *stockwerks*, and in pebbles, an assemblage of which is called stream works, where it occasionally takes a ligneous aspect and is termed wood tin. The late Dr. David Forbes, at a recent meeting of the London Geological Society, in 1881, said that he had received specimens of the granite from New South Wales the region in the year 1859, and that he found them to be perfectly identical with the stanniferous granites of Cornwall, Spain, Bolivia, Peru and Malacca.

Tin ore, or cassiterite, occurs in considerable quantity in the sands of the river of Tipnani, in Bolivia, where, from its greater specific gravity, it accumulates in the washing apparatus (lavaderoe) during the process for extracting the gold; this was particularly found to be the case at Playa Gritada, at the establishment of Don Ildefonso Villamil.

This cassiterite is generally in small semi-rounded nodules, frequently, however, showing one or more crystalline faces, and varying in size from a mustard seed to that of a hazel-nut. It is generally pure; that is, without attached rock substance; the color is mostly a dirty brownish-white or dark black, but fragments are occasionally met with of a fine wine-yellow color, or even colorless and transparent.

The stream or placer tin is always much purer, and consequently more valuable than that obtained directly from the mines. In Australia, the operations of the tin mines were at first restricted to the working of the beds and banks of existing water-courses and deposits near the surface, but now the beds of ancient streams 80 and 100 feet below the surface are found to contain rich deposits of tin ore, and the working of them does not differ much from that of the drifting works of our deep placers.

There are only two ores of tin, a peroxide or cassiterite, containing 78.62 tin and 21.38 oxygen, having a specific gravity varying from 6.3 to 7.1; hardness, 6.4 to 7. The color varies from white to pink, ruby-red, gray, grayish-black to black. The second variety, tin pyrites, containing 26.5 tin, 30.5 sulphur, 30 copper; specific gravity 4.3 to 4.5; hardness, 4; color, steel-gray to iron-black, often yellowish.

The following are a few ores and rocks that have been mistaken for tin: Titaniferous iron, magnetic iron, chromic iron, basaltic hornblende, silicate of iron, tungstate of iron, etc. Titaniferous iron has, however, only a specific gravity of from 4.5 to 5; hardness, 5 to 6; magnetic iron, 4.9 to 5.2; hardness, 5 5 to 6; chromic iron, 4 321; hardness, 5.5. The hornblende and silicate of iron have a specific gravity of about 4; tungstate of iron, specific gravity, 7.1 to 7 55; hardness, 5 to 5.5. The color of tin ore varies from white to pink, ruby-red, gray and black. It therefore is certainly no very reliable criterion for distinguishing tin ore. A safer characteristic is the weight or specific gravity. Unfortunately, tungstate of iron is nearly the same, or a little higher, but not so hard as tin, being only five. The color of the powdered ore forms a much better criterion than that of the unpowdered ore. The powder of good tin ore varies only from whitish-gray to dark drab, while tungstate of iron powders reddish brown, and titaniferous iron black. The value of stream tin ore, according to its freedom from gangue or dirt, varies from $200 to $300 per ton of ore.

The prospector may make a rude test of the suspected tin ore by pounding it up with some iron pyrites or magnetite and then washing it out with a batea; if tin, it will be heavier than either of those ores. Then use a little galena, and it will be found to be about the same weight.

EARTHQUAKES are again frightening people in South Carolina. Six distinct shocks were felt at Charleston about daylight Tuesday morning. The last shock, accompanied by rumblings, lasted nearly a minute.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AT SUTTER CREEK.—*Ledger*, Sept. 27: There is more stir in town than usual at this time of the year. The extension at the Wildman mill is rapidly approaching its proper shape. The south end of the mill has been removed, and will form the south end of the new part, thereby making the cost of constructinn much ligbter. In another week we expect to see the roof on. Drifting in the North Star is progressing slowly. The ground in each drift is very hard, which makes the progress necessarily slow.

Calaveras.

OLD MINING CAMPS REVIVED.—*Prospect*, Sept. 27: The vast placer beds about Murphys, Douglas Flat and Vallecito are beginning to receive the attention they deserve, and we may expect to soon see these camps the sites of active mining operations. The proposition for tapping the old river-bed by tunnels has taken tangible shape, and it will not be far in the future when more gold may be brought forth than ever before. The project is feasible and the possibilities stimulating to the highest degree. For years the water was the great trouble. Pumps, derricks and all contrivances failed to combat it successfully, and many good mines were abandoned. Now with a long drainage tunnel that difficulty will be obviated. It is reported that a tunnel will soon be started on Coyote creek beyond Vallecito and ultimately tap the deep deposits of both Vallecito and Douglas Flat. Recently the various placer mines of the latter town have been purchased by Eastern capital. Old ditches are being opened up, and upward of 50 men are engaged in preparatory work. The old placer claim of Chase, Coon & Pray will be the first to be put in shape for enlarged operations. P. S. Buckminster is general superintendent, and under his supervision no doubt all will progress favorably. With such men as Mr. Buckminster, F. R. Morse, C. Campbell, F. E. Mariner, Cox and Conly and others working hard upon a smaller scale, the success of the several enterprises they have in charge is assured. The Norfolk Co. have a splendidly equipped mill with all the necessary appurtenances, while the Total Wreck mill is a model of workmanship. These mills by doing custom work are just what is needed to assure an earnest and thorough prospecting of this section. Quartz mining is comparatively in its infancy in and around Murphys. A surveying party is in upon the Stanislaus river and rumor has it that a survey for a new ditch to convey water in the neighborhood of Vallecito is to be made. Cox and Conly at Indian creek are energetically at work upon their mines, and their new mill upon the San Antone will be in working order ere long. George Taylor is developing a promising lode upon Six Mile creek. His father, Jas. Taylor, is also working one of the best prospects in this vicinity, situated upon San Domingo creek.

WORKING LOW-GRADE ORE.—A German named Herman Trip owns a mine on the Mokelumne river in this county, the ore from which goes $1.42 per ton. He has erected a mill on it and a month's run yielded him $1700. His expenses were $700, leaving him just $1000 clear profit. We do not believe there is another mine of low-grade ore in existence that can be worked so remuneratively.

Inyo.

MARBLE.—*Independent*, Sept. 27: From the quarry of the Inyo Marble Co., Mr. A. Staudinger sent up to the county fair a display of fancy marbles. These are worked into various forms, and each piece is a gem of beauty. It is not possible to appreciate the value of these samples or to imagine their beauty without being seen. The most delicate fern-like figures run through the marble and these are interspersed with flower and leaf figures that look as of inlaid gold. Future cathedrals and palaces in far distant lands will be adorned with this beautiful marble.

Nevada.

ORE EXHIBIT.—*Transcript*, Sept. 24: The mineral display of the North Star mine is the finest ever made from any one mine on the coast. Large pieces of rich gold-bearing rock are shown from each level, all taken out within a week of the date of the exhibit. There is a glass case containing samples of specimen rock, a gold bar, amalgam, etc., and a number of tall glass tubes filled with sulphurets as shipped, while in one, arranged in layers, are specimens of the hanging-wall, quartz, calcite, gold, sulphurets and footwall, each showing its distinct color. On the wall a number of photographs show the workings of the mine both above and below ground. The Delhi mine is represented by a showcase containing specimens to the value of $1500. This mine has paid during the last two or three years some $320,000 in dividends. A. Tregidgo, superintendent of the Washington mine, has a large display of sulphuret gold-bearing rock from that mine. Fred Zeitler, superintendent of the Champion mine, has evidenced the quality of the rock by a heavy display.

San Diego.

MACHINERY TO BE PUT ON.—*Sentinel*, Sept. 26: The Julian G. M. Co. will at once proceed to put up $100,000 worth of machinery on their mine, which is joined on the west by the Cincinnati Belle, on the east by the Hidden Treasure, and in the immediate vicinity of the Stonewall mine, the property of Governor Waterman, from which $62,000 was recently made in a cleanup after a two weeks' mill-run. Two more new mining companies have been organized to do business in our camp. The San Diego Mining Co. has purchased the Antelope mine of Bailey Brothers, which has turned out a great deal of rich ore, something like the Golden Chariot of this district, which in former days sent out $20,000 to $40,000 a month from a ten-stamp mill. But few mines on this coast ever did better. A main working shaft is soon to be started on the Antelope and worked with a whim, while the hoisting works will be erected over it. A pair of hoisting engines 8x12 with a boiler 44 inches in diameter and 16 feet long, powerful enough to do a great deal of work. The Warlock Mining Co. has bought the Warlock and Chaparral mines, which are joined on the east by the Antelope and on the northwest by the Big Blue mine. The latter property was purchased by Waldo Waterman, superintendent of the Stonewall, for the Governor, for $50,000. Some of the richest ore ever taken out of any mine in camp came from the Warlock, although there has been some exceedingly fine ore milled from the Chaparral. There is now a force of men at work on these mines and more will be put on soon. Both the Antelope and Chaparral companies will be under the superintendency of John J. Minear, who is bringing in about 150,000 pounds of freight, a large five-stamp quartz-mill with power for ten, a sawmill, his own teams and wagons, mining supplies of all kinds, and provisions and men. Minear has bought a millsite of James R. Lowe at Banner, near the foot of the grade of the new road where he intends to erect his quartz-mill. No mines in the camp are better located for convenient working than those owned by the San Diego and Warlock Cos., being situated, as they are, about the middle of the group of mines between Julian and Banner, with the new road passing near the dump of each mine. The Kentuck, on the same vein, is showing up well.

Shasta.

OLD DIGGINGS.—*Free Press*, Sept. 27: R. G. Hart of the Texas mine is excavating for a mill-site on the bank of the Sacramento river, just above the Central mill. He is also making a road to get his lumber and machinery in for his mill. Work will be commenced next week on the Mammoth mine, cleaning out the upper drift which is caved. Walker Bros. were here week before last. They are having their mining claim surveyed for a U. S. patent.

FROM LOWER SPRINGS.—Considerable development has been made in the Thomson mine in the Lower Springs mining district. This district, as is well known, was formerly rich in placers, but outside of the Hartman mine, the quartz developments have been of a superficial nature. Ledges that have prospected well on top seem to have pinched out upon descending. Mr. Thomson, after purchasing this mine of B. Swasey, commenced its development in a systematic manner, and while he has met with some discouragements, there is a fair showing at the present time. Visiting this property last Sunday, we found an open cut and a tunnel running in a westerly course, about 300 feet. The tunnel then runs at a right angle some 30 feet northerly. About 17 feet distant from the commencement of the north tunnel, another branch tunnel has been run, and at a distance of 37 feet there has been struck quite a ledge of rich quartz, perhaps two feet wide. Over the roof of the tunnel also appears quite a quantity of good ore. The ore has assayed all along as high as $500 to the ton. The only trouble has been the pinching out of the ledge, but now, at quite a distance under the hill, the ledge appears to be widening out, and Wm. Sublett, who has charge of the property, thinks that further developments will produce a large ledge. It is proposed to sink a deep shaft with three compartments. The miners are beginning to open their eyes with wonder at the big returns they get out of their concentrates and sulphurets, and even the slum that passes away from mills, when properly saved and sampled, is of remarkable richness.

THE GLADSTONE MINE.—This property, since it was sold to the St. Louis company, has been more completely developed. A new tunnel has been run into the mountain 100 feet, giving 700 feet of ore backing. A 10-stamp mill is being erected and so located that the ore can be run out of the tunnel right into the mill.

HIGH GRADE.—Haskell, Spelman & Co. have been doing assessment work on their Flat creek mine. They say the ore in the tunnel is of high grade.

Sierra.

STARTED UP.—*Tribune*, Sept. 26: The Sunrise mine, situated on the north side of the river, just below town, and owned by the Uren brothers, has started up. They are in hope of striking the channel in a short time. All the mills in this vicinity are running full time, there being no lack of water or ore.

Siskiyou.

FROM THE MINING CAMPS.—Yreka *Journal*, Sept. 24: Interest in the Hungry Creek quartz mines is again shown by the presence of a number of mining men in town this week, and a very good offer has been made for the Thomas & Roberts prospects in that district, which will probably be accepted. Hungry Creek has some very good prospects that will make a camp of it yet, but it needs capital. The flattering reports from Humbug, Deadwood, and other mining camps have served to detract for the present from our prospects; but a few of the faithful have kept picking away, with the result that capital has become interested, so look out for a good camp here next summer. Chris Barry's claim, about three miles below Sawyer's Bar, is now yielding very satisfactory results, after three years of pretty tough luck. What is known as the Morning Star quartz-mill (8 stamps), up Jackass gulch, about 4 miles from Sawyer's Bar, was destroyed by fire some two or three weeks ago.

Trinity.

NEW RIVER.—*Journal*, Sept. 27: The Ridgeway Co. will begin taking out ore as soon as the ledge is struck, and will start up their 10-stamp mill, which is one of the finest in Northern California. Ladd & Clement, working on the Mountain Boomer, struck the best ledge they have yet found, and are taking out rock and running tunnels. The mill is running constantly. Colgrove has leased the Excelsior mine for two years to Fullmore & Favoren, who will develop the mine and crush the ore as they take it out. Williams & Hennesy are taking out good rock from their lease on the Sherwood mine, which is crushed at Ladd & Clement's mill. The owners of the Uncle Sam are taking out good ore and crushing it in their five-stamp mill. They have recently put in a new boiler and have everything in good shape. The prospects of the Jumbo mine on Virgin creek are good. McDowell & Bowerman are running a tunnel. Last summer they run in on the ledge and found everything satisfactory and will now tap it at a lower depth. This bids fair to be a very valuable piece of property. Smith Brooks is running the tunnel on the Mary Blaine mine and feels very confident over his prospects. Ladd & Irvin are working on the Hidden Treasure mine with prospects. On the whole, the outlook of the camp is very good. Money is more plentiful than it has been, and most of the mines are showing up well as they are developed.

FROM COX BAR.—Harrington & Gove, in their drift claim on Manzanita Flat, have struck a very rich streak of gravel yielding from 75 cents to $1 to the pan. C. J. Johnson is working some very good ground in his claim. Bigelow, Spratt & Smith are fitting up the Wilshire hydraulic mine for next season. They will have their new half-mile ditch completed by the latter part of October. They have some good ground and will undoubtedly do well next season.

FISHER GULCH.—The Fisher Gulch M. Co. has purchased a Huntington mill and will have it on the ground ready to set up in about three weeks. The mill will be run by water-power, a Pelton wheel being used for that purpose. The force on the Bailey mine is now working on the ledge first tapped. As far as they have run the tunnel on the ledge the ore shows up well. Grigsby & Shattuck are getting in their mill as fast as possible and will probably have it on the ground in a few days, and in about 30 they expect to have it running. All work in the camp is being pushed ahead, and some time this fall it will be found what some of the ledges contain.

Tuolumne.

MILL. — *Independent*, Sept. 27: A 20-stamp mill has been purchased in San Francisco for the Hyde mine in this county. It will be shipped to Sonora immediately.

GOLDEN GATE.—There is some talk to the effect that the Golden Gate mine will shortly change hands; that $250,000 have been offered for the property, and that the present company is now considering the offer made. Hayward & Hobart are the parties seeking to purchase.

NEVADA.

AT HAWTHORNE.—Walker Lake *Times*, Sept. 27: Much lead and silver ore of good grade is being shipped at Hawthorne, being sent to that point from adjacent districts. The large number of "applications for patents" to mineral lands advertised in the Elko *Free Press* is by that paper considered evidence that mining is a live industry in that part of the State.

OUTLOOK IN EASTERN NEVADA.—Tuscarora *Review*, Sept. 26: Some Denver mining men have been looking at mines in Eastern Nevada. There were well pleased with all they saw. They say they have nowhere seen a better opening for capital. That such mines as they saw should be lying idle astonishes them.

THE JOANNA MINE.—Chas. Moffley, who is back from Ely, the county seat of White Pine, considers the Joanna mine a great bonanza, the gold ore being free milling with a value of $10 a ton and a mountain of it in sight. Fourteen tons of rock taken from an extension of this claim assayed $223 in gold and $17 in silver.

ARIZONA.

GLOBE NOTES.—*Citizen*, Sept. 27: A party from Pioneer reports chloriding active at that camp. Considerable silver is being mined. The Quartet Mining Co. commenced packing ore from the Loco mine to the Nugget mill on Thursday. They have 100 tons of it, but will work only 30 tons now. The stamps commenced to drop this morning. A lot of low-grade ore from the Rescue and some from other claims at Quartzite will next be worked. It is expected to keep the mill in constant operation. After a brief idleness the Old Dominion Copper Co. resumed operations at the mine and smelter yesterday. One furnace was blown in and a second will be started within a few days. Coke teams delayed by bad roads are moving all along the line and will arrive in numbers next week.

MOJAVE COUNTY MINES.—Mojave *Miner*, Sept. 27: P. Benson will put a force of men at work on the Harrison mine, at Chloride, next week. Barney McCall had a carload of ore from the Empire, on which he has a lease, worked at the sampling works. He was satisfied with the result. John Brickle, "Tex," who has a lease on the Cupel dump, had a carload of ore worked this week with such satisfactory results that he will continue sorting the dump. The Cargo Muchacho mine near Yuma caved last Tuesday and imprisoned two miners for 42 hours. They suffered some from hunger but otherwise were not injured. The superintendent of the mine gave them a week's leave of absence with full pay. P. H. Tompkins brought in about 1000 pounds of ore from the Gunsite, in Cedar Valley district, on Wednesday. The ore is of the same character as came from this mine several years ago, and is very rich. J. W. Munn had a lot of ore from the Music mountain run through the sampler which, while not of as high grade as usually comes from that district, was satisfactory to the shipper. The mines in this district are doing fairly well this year, with every prospect of improvement. The Kingman Sampling Works received this week 1000 pounds of ore from the Ivanpah district which was worth $1 per pound. Auriferous sand has been found in the Sulphur Spring valley in paying quantities. From 10 to 20 feet below the surface a large body of water and quicksand is encountered. The latter is brought to the surface more or less by pumping water for cattle. In this way the tub which had been used for pumping water retained in the bottom considerable black sand, which was scraped together by E. S. Adams, of Bisbee, who saw what he thought was gold mixed through it. He brought some of the truck over to Tombstone and took it to Frank Earle's assay office, where Col. Hart pronounced it gold without a doubt. There is no doubt that the bed of the river lies underneath this valley, and with proper prospecting, gold in paying quantities will some day be found.

EXPERIMENTING WITH THE POORER ORES.—*Silver Belt*, Sept. 26: The trial of working medium and low grade ores in the Nugget mill will be watched with considerable interest. In case 40 and 50 ounce ore can be worked with profit, it will give an impetus to silver mining in this district, as there are considerable quantities of such ore within easy packing distance of the mill. In anticipation of the success of the experiment, miners have purchased the dumps of several mines at and around Quartzite and Richmond basin, which they propose having worked.

ARIZONA ONYX.—*Journal-Miner*, Sept. 24: Hon. J. W. Dougherty and T. S. Bullock, president of the P. & A. C. railroad and vice-president of the Monterey & Mexican Gulf railroad, returned last evening from spending a couple of days at the onyx mines, at Mayer's station. The last-named gentleman was delighted with the vast extent of the quarry and the superb beauties of its stone and pronounced it as far surpassing any that he had ever seen during a long and extensive experience in railroading in Mexico, during which he had handled in the way of transportation great quantities of the onyx of that country. No better indication, perhaps, can be given of how highly he regards the Arizona product than the fact that he has made arrangements to have two carloads of ten tons each of it shipped to New York to be used in the interior decorations of a half-million dollar residence he is building there.

BRITISH COLUMBIA.

MINERALS OF ALL KINDS.—Nelson *Miner*, Sept. 20: In Hot Springs and Toad Mountain districts are found free and refractory gold ores, placer gold, peacock and gray copper ores running high in silver, low-grade copper ores, nickel, lead ores high in silver, low-grade galena ores, ores carrying zinc and antimony along with gold and silver; in fact ores containing the precious metals in all sorts of combinations. Backing up this great mineral wealth is an unlimited water-power, only awaiting the income of capital to make it useful in turning our ores into bullion or matte. Less than 200 miles distant is the most promising undeveloped coal-field in the Northwest—that of the Crow's Nest pass—which only awaits the advent of a railway to become the center of a great industry, and from which future reduction works and smelters on Kootenay lake will draw their supply of coal and coke.

PLACER DEPOSITS.—The old-time traveler on the government trail between Nelson and Ward's ferry would, by seeing the muddy water running in 49 and Bird creeks, imagine himself back in the placer districts of Northern California. Quite a number of Chinese are at work on the latter creek, one of the railway gangs deserting almost in a body, preferring the more congenial labor of washing out gold to that of shoveling gravel on a side-hill cut. The hydraulic company on 49 creek are at work, and their first cleanup will be a surprise to doubters who claim there is nothing in placer mining.

COLORADO.

MARSHAL BASIN.—Idaho Springs *News*, Sept. 26: The Andrus mill is treating a 50-ton millrun from the Big Elephant lying in the Savage fork of Marshal basin. The Elephant, vein is the largest in the camp, being from 8 to 12 feet between walls, the entire ore body being almost uniformly impregnated with mineral of low grade. The result of this run will determine the question of the erection of a mill.

ASPEN.—The richest strike in this district has just been made in the Aspen mine, the assay value of the ore for an average of 20 feet being 730 ounces silver to the ton. The ore is a soft lean carbonate in the brown lime. There are no rich and lean streaks, but the body has a uniform grade. The ore has been penetrated for 20 feet without any sign of a wall. It is on the sixth level, 100 feet north of the electric winze and at a depth of 465 feet from the surface.

WAITING FOR THE RAILROAD.—When the railroad reaches Ashcroft, that mining camp will experience a boom. It is situated in the midst of the mineral section of the State, and it has long been known that extensive deposits of mineral exist there. It is one of the camps which await the approach of capital for the development of the mines and the construction of a railroad for the transportation of ore to a market.

NATIVE ALUM.—Nodules of native alum from one to three inches thick are of frequent occurrence in the Pennsylvania mine near Georgetown.

THE HENRIETT & MAID.—It would appear that as depth is gained on this immense body of sulphide, the silver value steadily increases. Probably not until the Cambrian quartzite is reached will any correct idea of how this chute came to be there, or the method of its occurrence be demonstrated, if then. There is, of course, a possibility of its being the main ore vent of Carbonate hill, though at present there are no indications to give evidence for the fissure theory. At any rate at the 750-foot, or lowest and last level now, at about 70 feet from the shaft, the chute has again been met with. That is to say, that at that point pay ore was encountered, though the wall of the chute had been cut through and mineral met before this point was reached.

SILVER CORD.—Denver *Republican*, Sept. 27: A few men being worked in the A. B. Willard claim are getting out some fair-grade ore. Another point in the Attawa where a few men also are working, is producing some sulphide sand ore, that has the appearance of being broken off concentrates, so fine is it. Some considerable prospecting is being done by the company up in the contact below the Gross shaft, and some 80 feet above the incline, which is in the limestone. On the second level some lessees are doing very well, gleaning about the old workings.

MONTANA.

GENERAL ITEMS.—*Mining Review*, Sept. 27: The Boulder sampling works are to close this week, the patronage extended not being sufficient to warrant the necessary expenditure. The Ben Kimber Co. has stopped shipping ore for the present and are devoting all their energies to driving a 500-foot tunnel. A carload of ore from the Emma Nevada, sent to Butte, netted $128.38 per ton, running 120 ounces silver and $16 in gold. Eleven cars of ore, shipped from various parts of the State, were received at the U. S. sampling works of this city during the past week. The output of the Granite Mountain for the week ending September 18 was 45 bars of bullion, containing 64.416 ounces fine silver and 168 ounces fine gold. It is rumored that the Empire mine has passed into the hands of the Montana (Drumlummon) Co., and that work will be resumed upon it in the near future. The annual statement of the Elkhorn Queen Mining Co., filed with the Secretary of State, shows a fully paid-up capital of $1,000,000 and indebtedness of $13,662. Four tons of ore have been shipped to Butte from the Gold, near Whitehall, Jefferson county. The ore is base and will probably run $100 in gold and silver, the former predominating. The Crescent mine is shipping weekly four carloads of ore netting $2500 a car. About $25,000 has been expended on the property and the owners expect to soon realize that and a great deal more. The shaft of the Mountain Chief, near Neihart, proves very valuable to the property. The company is now at work on a tunnel that, it is esti-

mated, will tap the lead at a depth nf 1200 feet. It will place the Chief among the deepest mines in Montana.

Coal.—Mr. Victnr E. Tull returned from the Gallatin basin on Mnnday, says the Bozeman *Avant-Courier*, bringing with him snme nf the finest samples of bituminnus and cannel cnal tn far discovered in Mnntana. Mr. Tull repnrts several additinal discoveries of what promise tn be excellent and valuable coal measures in the vicinity of the basin, and predicts a great future fnr the new mining district.

Bismuth.—The Mnntana Bismutb Co. has let a contract to R. P. Matheson for an extension nf the tunnel nn their prnperty in Emigrant gulch, Park county. It is estimated that the tunnel will reacb the lnde in less than 50 feet from its present face.

From Beaver Head.—The Brittle Silver grnup nf mines in the Vipond district nf Beaverhead county, have come into the possession of Prof. Churchill and Dr. Jnbnson nf this city, who purchased them for $15,000 and will directly inaugurate extensive develnpments. The Brittle Silver is already in producing conditinn. The Vipond district is shnwing up well, and will become one nf the best mining districts in that cnuntry.

Districts Tributary to Rimini. — Helena *Mining Review*, Sept. 26: In the anxiety to find better paying mining fields, prospectnrs are apt to overlook nr neglect those near them. Such bas been the case with the districts of Red Mountain, Cataract and Basin, which ship their nre frnm Rimini. There are many good mines in this region, but development has gnne nn slnwly fnr lack nf means and nther causes. As high as ten carloads a week are nnw shipped fmm Rimini, and much of this is ore obtained frnm develnpment wnrk. The attention nf some capitalists has been directed to these districts and several deals are nnw nn band which are likely tn be consummated, and next year we will expect shipments frnm Rimini to be dnubled. The Crescent has shipped a bundred tnns of ore tbis montb. It nnw has a gond steam bnist which works well. The Ida May bas a new steam bnist with a sawmill attacbed, and bas paid from the grass roots. Two or tbree tnns nf shipping ore are being taken from this mine every shift. The Lee Mnuntain, an old and well-knnwn mine near Rimini, bas changed bands and will be worked more extensively than ever. A large dry concentratnr will be put in tbis year. The Buckeye bas been bonded to Swan and others, and work will be pushed on it from now onward. There are some two or three carloads of ore awaiting shipment at the mine. The Sally Belle is one of the steady shippers, and witb development, every one having knowledge of it expects it to be a great mine. The Ontario, on the Blackfoot side of the range, is sbipping from three to five carloads of ore a week. The Eureka, at Rimini, is shipping from five to seven cars a month. J. F. Smith reports lively times at Jack's creek. The Fisber Bros. made a strike tbere last June, and at a deptb of 25 or 30 feet the ore runs frnm 400 to 800 ounces in silver. Finds of gray copper bave also been made. Many claims have been staked off. The section is a new one, heretnfore difficult of access, but tbere is now a road almost completed to the mine.

IDAHO.

Leasers Doing Well.—*Silver Messenger*, Sept. 27: The lesses of tbe Parnell mine, in Narrow Gauge gulch, are doing very well. They bave about 50 tons of ore on the dump, of wbicb about 20 tons is first-class, wortb about $150 per ton, and are extracting more right along. As soon as they get 40 tons of second-class ore on the dump they will sbip it and lay in their winter supplies in order to open the property sufficiently to justify the construction of either concentrating works or hand-jigs next spring.

Bullion and Ore.—The Pacific Express Company yesterday shipped seven bars of bullion from the De Lamar mines, two from Banner, and about $25,000 in gold from the assay office. The Standard Co.'s mine (the Nay Aug) is sbowing a foot or so of solid ore and is exceedingly promising; but although this is between tbe fourth and fifth levels, at a depth of about 375 feet from tbe surface, the developments are not sufficiently extensive to demonstrate the extent and value of the ore body.

Mine Sold.—Jas. F. Wardner of Fairhaven bas just completed tbe sale of the Boston mine, owned by Rouse Bros., to M. E. Downs, manager of the Jay Gould property, Montana. The mine is situated in tbe Cascade mountains, about 100 miles from Fairhaven, Wash. The price paid was $150,000. It was discovered about a year ago, and is considered to be one of tbe best galena properties in tbe Nortbwest.

OREGON.

At Cornucopia.—The Portland Mining Company bave let a contract to sink a sbaft fifty feet on the Stransburg mine. A fine body of gray copper ore bas lately been struck in the Pride of Pendleton mine and J. C. Powers, the superintendent, is working quite a force of men. A night shift was put on last week and the company may work all winter. Several sales have taken place lately and capital is beginning to move in this way. The Greenhorn mountain is the treasure-box of Oregon, and all tbat it needs is more development work to show what we have. We can show high grade ore witb any camp in the West, and as mucb of it. Col. Turner feels highly elated over the recent $100 assay from bis Senator ledge. The mines on Greenhorn still continue to pan out well and larger amounts of work by way of development will be done this winter. The Cleveland parties are now engaged in sinking a 50-foot shaft and running a 150-foot drift. The Phœnix mine is also to work this winter witb a force of men. The Bill Morris mine is showing up well and will also work a force of men this winter. Mr. Turner will also develop the John L. Sullivan mine which promises well. The Webfoot, close to the old town of Robinsonville, is going to run a crosscut of about 75 feet to intersect the vein, and quite a large amount of other work will be done in the vicinity.

Another Cleanup.—Two bundred ounces in gold! That is tbe amount of a partial cleanup from the Nelson gravel mines, brought to our city yesterday by Samuel Baisley, superintendent of the mines, and deposited in the Baker City National Bank. Two hundred ounces means $3600 and only a partial output of tbese mines for the season of 1890. Prior to this the output of these mines for tbe present season bas been $25,000. Added to the cleanup nf $3600, we have a total nutput nf these mines this year of $28,600. What the entire amnunt will be at tbe close of the wnrking season when the final cleanup takes place is difficult to estimate, but it will certainly be in the neighborhood of $50,000 or $60,000. Mr. Baisley informed the repnrter that the mines were wnrking with a great supply of water and nperatinns would be continued late this fall or until the cold weather and snows make it impossible tn cnntinue lnnger.

LOWER CALIFORNIA.

Notes from Alamo.—*Lower Californian*, Sept. 25: Alamo continues to turn nut gnld. Fnur mills are at work and arrangements are being made to start up the El Pasn Co.'s 10-stamp nill. The Santa Clara Cn.'s mill will sonn receive an additinn of five stamps, as ore is being taken nut nf the Aurora faster than it can be milled. Night and day shifts are wnrking since the pump was put in. The Manzanita Co. is rushed with orders for crushing custom nre. Several new rock-crushers bave been nrdered tn keep up with the demand. The Princesa mill is running day and night nn the company's mines, principally the Ulises and Indin. The latter mine was closed down Saturday, pending the arrival of hard-rock miners from California. A dike nf the hardest kind of granite was struck last week. The pumps are kept wnrking constantly. The Mnntezuma mine will snon show up its richness thrnugb the five-stamp mill lately mnved over frnm Mexican gulch. Prnbably the best strike ever made in the district was uncovered last week in the Ulises. In drifting along the ledge nn the 100-foot level, a new vein was encountered which joined the nld vein at an acute angle. Tbe point of junction was cut and tbe vein showed a width of five feet, every foot of which yielded quartz fairly bristling with gnld. A contract for an air sbaft 100 feet farther along was immediately let, and drifting was started alongside tbe new vein tnward the sbaft. The nre body beld its size and richness tbe entire length. Tuesday the connection was made witb the air shaft and the wnrk of stnping began. The result is an immense body of rich ore tbat assures the wnrld that Alamn is bound to become a camp of importance. The ore is of a different variety tban any yet struck.

UTAH.

Coal in Cache Valley.—Salt Lake *Tribune*, Sept. 27: B. W. Driggs, attorney, on Wednesday made out the papers for the transfer of $500,000 stock on tbe Cannel coal deposit in Cacbe Valley. He says that tbe syndicate now in control will build a railroad at once. This coal bas been coked at the Eagle foundry and pronounced the best coking coal in tbe west. Tbe price paid for tbe valuable coal land is understood to be $50 000.

Ore and Bullion Shipments.—The shipments out from tbis city for tbe week ending Saturday, Sept. 20, inclusive, were as follows: 10 cars bullion, 302,693 lbs; 5 cars copper matte, 177,100 lbs; 70 cars silver and lead ores, 2,672,643 lbs; total 85 cars, 3,152,436 lbs.

Tunnels Projected.—Tbe Crescent mine management has surveyed for a new tunnel 8000 feet long wbicb will strike tbe sbaft line 1500 feet below the 200-foot level. The tunnel is for drainage purposes. A fine lot of ore has been struck in the shaft and more is coming. Mr. Stebbins, of Van Buskirk and Stebbins, will start work on the big tunnel to tap the ore body in the Belcher group, on Friday. It is thought that a distance of 700 feet will reacb the main chute, but it requires development to prove tbe exact locality of ore. David Keitb of the Ontario and Mayflower, Park City, has secured a lease on the Silver King mine at that place and will start work on the property as soon as the steam hoist and other machinery ordered, arrives. The Silver King is considered to be a very valuable property.

Cache Valley.—Salt Lake *Tribune*, Sept. 27: There is considerable excitement in tbe Cache Valley over the recent discovery of gold in the mountains just north of Logan. The bills are covered with prospectors, and from recent discoveries it is thought that another Tintic will develop in that region before many months. Old miners say that the new field is a good one and great developments may be looked for.

Tintic.—Evidences of the mineral wealth of tbis district come thick and fast. At Mammoth, a few days since, while leveling the surface of the ground for the foundation of a house, a vein of rich ore was uncovered, and as a matter of course, immediately staked off and recorded. In the town of Eureka a similar experience was encountered; the workmen engaged in digging a vault a day or two since, having discovered a vein of valuable ore.

Good Coal.—Frank Milner bas made a ricb discovery of anthracite coal in Slate canyon, a few miles east of Provo. He is using the coal at his home and asserts it is equal to any imported from Colorado.

WYOMING.

The Big Horn Mines.—*Pioneer*, Sept. 27: Interest in these mines increases as new and richer specimens are brought in. A sensation was created Thursday when a specimen of ore from a newly-discovered vein ahout two miles beyond the one originally opened, was subjected to a rough test and found to carry about $400 in gold to the ton. Sacks of ore are leaving Buffalo by nearly every express, bound for the laboratories of assayers. The prospects are about 90 miles from Buffalo, in a region where old-time stories located rich gulches, to find which many a man has lost his life from hostile Sioux. The dirt has to be hauled to water. Out of six loads one man got $250, and several $20 to $25 nuggets have been found. Cheyenne is agitating the project of a State niners' convention to be beld in that city to consider measures for bringing to public notice the great mineral wealth of the State.

Simple, Substantial, Satisfactory.

The College City Steam Pump exbibited at the State Fair, bas long beld its own as one of the most simple and economically working premium pumps ever invented. It is manufactured by its proprietors, Root, Neilson & Co., at their own establishment, the Union Iron Works, Sacramento. Parties interested in steam-pumping apparatus sbould send for tbeir circular.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 23, 1890.

436,931.—Traction Engine—Daniel Best, San Leandrn, Cal.

436,932.—Injector—Daniel Best, San Leandrn, Cal.

436,933.—Boiler—Daniel Best, San Leandro, Cal.

437,101.—Water-Closet Indicator—J. Dihrberg, Visalia, Cal.

436,936.—Explosive Engine — J. W. Eisenbuth, S. F.

437,029.—Axle Machine—Silas Harris, S. F.

436,786.—Shipping Receipt Book — J. Howe, Tacoma, Wash.

436,946.—Pneumatic Railway - J. B. Kelly, Pleasant Home, Or.

436,938.—Governor—J. F. Kirby, S. F.

436,859.—Car Coupling—N. Kramer, Sacramentn, Cal.

437,128.—Circular Saw—W. A. Miller. Wapinitia, Or.

436,841.—Sash Fastener—Z. Pinard, Portland, Or.

437,002.—Block Puzzle—J. A. Rueger, S. F.

436,942.—Lawn Sprinkler—Thns. Scheen, St. Helena, Cal.

437,135.—Wire-Drawing Drum—W. W. Shearer, Port Angeles, Wash.

436,861.—Uterine Supporter — A. T. Sherwood, S. F.

436,809.—Door Check—Wm. Shipsey, San Luis Obispn, Cal.

436,950.—Wire Fence Stay—M. S. Turkington, Tulare, Cal.

436,814.—Electric Arc-Lamp — A. Wagniere, Los Angeles, Cal.

437,064.—Hame Hook—J. H. Watson, Selma, Cal.

436,943. — Lifting-Jack—Hugh Wilson, Duncan's Mill, Cal.

The following brief list by telegraph for Sept. 30 will appear more complete on receipt of mail advices:

California—Robert Addison, assignor of one-half to A. F. Mills, Pasadena, portable centrifugal lawn sprinkler; William H Andereon, Riverside, package-tie; Howard W. Brown, Oakland, copying-sheet; Harris G. Cox, San Jose, check-bltr; Herbert F. Dugan, S. F., coin-operated telephone attachment; Leonidas Guillmet, S. F., air-brake; Charles Iselen and D. Callahan, Riverside, remedy for asthma; William Jones, S. F., lime-kiln; Benjamin F. Levett, assignor of one-half to F. W. Stewart, San Diego, hose-coupling; Demitry Niddlekaut, S. F., explosive compound; Arthur F. Purley, Lawrence, telegraph key; Carl Stratbmeyer and W. G. Gutenberger, Sacramento, car-coupling; Edgar Thompson, S. F., dental engine. Oregon—Alex H. Quain and G. P. Warner, Albany, high-grade water-power.

Note.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable ratee, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press U. S. and Foreign Patent Agency, the following are worthy of special mention:

Boiler.—Daniel Best of San Leandro, California. No. 436,933, Dated Sept. 23, 1890. This boiler is specially adapted for burning straw as a fuel, and is what is known as "portable boilers," being adapted to be mounted on wheels for use in connection with traction and field engines. The improvements relate to the relative position of the tubes, furnace and grates, the construction and mounting of the latter, the means for holding the grates in position, and the door openings and straw-feeding funnels.

Explosive Engine.—John W. Eisenbuth, S. F., Cal., assignor by direct and mesne assignment to the Electric Vapor Engine Co., same place. No. 436,936. Dated Sept. 23, 1890. In this engine, which is of the type in which the gas is exploded by an electric spark, the electrodes are peculiarly constructed, being concentric and insulated both from each other and from the engine cylinder through which they pass. Their outer ends are in the valve chest and their inner ends carry permanently separated plates, the circuit being made by an arm or finger carried by and insulated from the piston and adapted to simultaneously make contact with said separated plates. There is also an independent circuit closer and opener working automatically and which controls the operation of the electrodes.

Lawn-Sprinkler.—Thomas Scheen, St. Helena, Cal. No. 436,942. Dated Sept. 23, 1890. This sprinkler consists of a cylindrical head adapted to be fitted to the nozzle. The head has a central opening and a closed outer end. A slit is made with outwardly diverging walls from the central opening to the periphery of the head, and a socket is made in the opposite side of the head to receive a supporting pin. The location and shape of the exit slit provides for the proper area to be covered by the sprinkler and produces a fine, delicate spray like rain under light pressure and a mist under heavy pressure.

Traction Engines.—Daniel Best, San Leandro, Cal. No. 436,931. Dated Sept. 23, 1890. In this machine are a number of improved features. The general frame includes an angle-iron or bracketed frame with lugs, between which pass the side-bars of the main frame, and said angle-iron frame also supports the boiler. The location of the crank-axle and springs is a distinct improvement, and in connection with these and supporting brackets certain adjusting and brace-rods are used. The intermediate draft connections and the power-transmitting mechanisms are also features of novelty in the device, all the improvements in which are designed to better its working and increase its durability.

Injector.—Daniel Best of San Leandro, California. No. 436,932. Dated Sept. 23, 1890. This injector consists, in connection with a jet-nozzle, of an inlet supply-pipe of peculiar construction. This pipe is made up of portions of successively increased diameter, the smallest portion being opposite the jet-nnzzle. Holes are made in the pipe at its several shnulders, and its nther end is cnnnected with the discharge. As many of these portinns of increased diameter may be bad, and the object is to admit tne water in small quantities tn the first portion where it is first acted on by the jet, and then as the body acquires a certain mnmentum, to admit an additional quantity nf water at each succeeding series of hnles, which will be more readily carried onward on account of the acquired momentum.

Door-Securer. — Abram Duane Norton of Delta, Idabn. No. 436,94n. Dated Sept. 23, 1890. This is a small and pnrtable device which can be carried abnut, readily applied when needed and as easily remnved when the occasion fnr its use is past. It consists of a main bar adapted tn be inserted between the door and casing and there held by teetb nn its inner end, being fnrced into the casing; a brace bar, hinged to the outer end of the main bar and adapted to have its inner end fitted against the inner surface nf the casing, and a holding bar pivnted to the main bar and adapted tn have its inner end fitted against the inner surface of the donr.

Lifting-Jack.—Hugh Wilson, Duncan Mills, Cal. Nn. 436,943. Dated Sept. 23, 1890. This jack belongs in that class in which a vertically sliding lifting-bar is operated by gearing within a case through which the lifting-bar slides. The improvements in this jack lie in the nnvel constructinn of the casing, and nf the ratchet pawl, by which the movement of the gearing is arrested at any desired pnint, so as to bold the lifting-bar and its lnad wherever desired.

Governor.—John F. Kirby, S. F., Cal. No. 436,938. Dated Sept. 23, 1890. This governor is adapted to regulate the engine tn the wnrk to be performed, and is independent for its action upon said work. It is not dependent for its operation upon the speed of the engine, as the ordinary governors are. This governor cnnsists essentially nf a wheel loose on the sbaft and connected with the work, a wbeel fast on the shaft and connected by springs witb the loose work-wheel, a sliding piece, and rock shafts between the work-wheel and sliding piece having their oppnsite ends connected with the loose and fixed wheels, so that tbe independent movement nf the wnrk-wheel, due to its spring connection, is transmitted tn the sliding piece, which piece regulates tbe valves.

Mining Share Market.

Tbe spasmodic effort to send prices up, noted at the close of our last week's review, did not hold longer than Thursday, for tbe market bas dragged heavily since then at lower prices. It looks as if something more than promises, particularly when the latter are soured by assessments, must be done to inspire confidence witb tbe moneyed public, and bring them in as active buyers. There is no question but the situation on the Comstock warrants more active times, if not higber prices for stock; yet staring operators in the face is tbe well-known fact that there is not a mining company on tbe lode paying dividends, but in lieu thereof several have levied assessments, while other assessments are pending, particularly in the Gold Hill group of mines, to pay pumping expenses. Notwithstanding tbe above drawback, we are still firmly convinced that an upward move in the market is near at band, so, if possible, to unload mining shares on the outside public at higber prices. The latter always buys when the market is up and made active by attractive fluctuations.

In outside stocks, Bodie bas sbown more life, due to the mill starting up on some ore saved in doing deadwork. Last year tbey bad an election contest fake. The price went up to $2.15 a share and then down under assessments to 30 cents a share. Unless the company finds more ore than the mill is running on, the mill will not crusb long, but perbaps long enough to peddle out stock. The Tuscaroras have a steadier tone, as if the pool is buying stock. Central in the Quijotoas bas been dealt in more freely.

The news from the Comstock mines is about the same as reported in our last week's review. In Alpba, on the 600-foot level, the downward continuation of the ore found on the 500-foot level bas been run into. It is said not to be poorer than found above. Crosscuts are to be run on the vein or ledge. In Potosi, crosscuts will soon be started from tbe drifts run nortb and soutb from tbe winze. On or about (perhaps before) the middle of this montb the pumping out of the Gold Hill mines will be commenced. Experienced miners look with confidence to better times, when the mines are drained and work is resumed on the lower levels. Tbe reported contest for the control of the Andes mines gives color to the report published by us of a rich strike by Con. Virginia in their west workings in the Andes ground. More work has been done in the latter mine under the Billy Brown management than for several years previous, and tbis, too, witb fewer assessments. Many believe tbey will put more men to work so as to develop the ricb find made by Con. Virginia on the 800-foot level.

At a special meeting held to-day of the Andes Mining Co., no changes were made in the Board of Directors.

From the outside mines tbe news is not of an exciting character. It is similar to that published last week—all of an encouraging nature.

Our Agents.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none out worthy men.

H. Kelley—Modoc and Lassen Cos.
T. B. LeSieur—Humboldt Co.
Geo. Wilson—Sacramento Co.
J. P. Quinette—San Francisco.
J. C. Hoag—San Francisco.
W. J. Hancock—San Francisco.
Samuel Cliff—San Luis Obispo Co.
W. W. Theoealds—San Bernardino, Cal.
J. H. Crossman—San Bernardino Co.
John B. Hill—El Cajon, Cal.
E. H. Schaeffle—Calaveras Co.
W. B. Frost—Placer and Nevada Coe.
B F. Belt—Shasta Co.
Wm. M. Hillbary—Oregon.
John Simpson—Oregon.
Wm. Holder—Oregon.
H G. Parsons—Arizona and New Mexico.
R. G. Huston—Montana.

MECHANICAL PROGRESS

How Iron Chains Are Made.

It is safe to say that there is not a boy with eyesight who has not seen an iron chain, perhaps only a common dog chain, or perhaps the great chains from which ships' anchors are suspended. There is nothing striking about a chain except as an emblem of strength, but to the ordinary boy there is a mystery about the method of manufacture which this article from the Pittsburg *Dispatch* may dispel:

The first operation is the making of the links. The material comes in coils, each containing from 80 to 120 feet of round iron rod, which is of uniform diameter and of various size, corresponding to the different styles of chains.

A piece of this wire is placed in the groove of a powerful machine, the wheel is started, a twisting motion imparted, and the iron comes forth in a spiral roll, looking as the outer strand of a rope might if separated from the component parts.

The groove into which the iron is pressed, and the spindle-like arrangement about which the coil is formed, make the coil exactly uniform throughout, the links being the same distance apart and of the same size. The machine does its work rapidly; but little time is consumed in converting the 80 or more feet of rod into shape for the chain links.

The next step in the manufacture of a chain is the cutting of the links. The spiral coil goes from the hand of the first workman to another, who places it in a long sheet-iron trough suspended as high as a man's head, one end hoing considerably lower than the other.

One end of the coil is then submitted to the operations of the cutting machine, which, at a single blow, strikes off enough of it for a chain link. The machine is regular and rapid in its motion. The workman has only to hold the iron in position, and from 200 to 275 links are cut every minute. They drop into a spout and roll therefrom into a small cart, which is hauled away full to the welding department.

So far, all the work has been done without the agency of heat, but the chain cannot be completed without the agency of fire.

The final operation is welding the links together. Standing beside a furnace in which a hot natural-gas fire is blazing, the workman seizes a piece of the white-hot metal with his tongs, places it on a die, and putting his foot on a treadle, causes a spring hammer to descend, giving shape to the link. Two outer turns and two more blows of the hammer, and the link is completely formed and welded together. Another piece is then taken from the fire and the open end deftly slipped around the link just formed. It is then operated upon just as the first link was—another is added, then another; the chain is growing rapidly—so fast, indeed, that two feet or more of it have been finished before the red glow has died out of the first link welded.

Of the small chain, which the workman is now making, the welding of 3000 links is considered a good day's work. More can be made of a smaller size and less of a larger. It is very hot and noisy work.

Rolling Cold Steel.

The particles of any metal in cooling are supposed to make a definite crystalized arrangement. Heat, in a certain sense at least, is as to the atoms a disintegrating or repellent power, and under great force or pressure, crystallizations may be compelled to rearrange themselves on new lines, or submit to a change in form. In drawing wire, for example, the force applied is in the direction assumed by the fiber, as softened by heat, and its strength is supposed to depend upon this arrangement of particles, compacted more or less by the die through which it was drawn. Now rolled wire is a reversed process, as the compression of molecules both changes their form of arrangement and form of crystallization. Up to a recent period heat was always supposed to be a prime factor in the process, and that without it no alteration in what may be styled grannlation was possible. Now a Chicago paper announces a change in manipulation that completely explodes the old theory. Bars of cold steel are as easily rolled into wire as if the metal were hot, and not only that, but the process nearly doubles the tensile strength. That of hot-drawn steel wire is 56,460 pounds to the square inch, while cold-rolled is 105,800 pounds.

What is the nature of the changed arrangement of particles that produces such results? It must be compression that forces the atoms into new forms, or compacts them more closely together, and yet one effect of compression is to evolve heat. The fact of added strength is abundantly vouched for, but the reason of it remains to be explained. Manifestly, if wire can be rolled from cold bars with such results, why may not steel plates for ships or other purposes—yea, why not even railroad bars? If these things are possible, with strength doubled and cost diminished, this manufacturing industry is certainly on the eve of a total revolution. Science, too, has added to its domain the wealth of a new discovery whose value is beyond estimate. Gains on any line of advancement, as all experience proves, are but a prelude to greater gains on other or similar lines. The ending of a beginning in what is new now is beyond the ken of the wisest.—*Iron Trade Review.*

Pressed Steel Journal Boxes.

Pressed steel for journal boxes is fast coming into large use in England, especially in car manufacture. The process of manufacture is very simple and rapid. It requires only about two minutes' time after the plates leave the furnace to finish a box. The company manufacturing them is now turning out about 2000 boxes per week to meet the requirements of the trade.

These boxes are generally, says the *English Railway Review*, not more than one-third the weight of a cast-iron box of the same general design. On the London, Brighton and South Coast railway, some boxes of peculiar design, weighing only 12 pounds, are supplanting cast-iron boxes weighing *forty* pounds, have been in use two years, giving far better satisfaction than the cast-iron boxes. Of course the *average* box is going to weigh more than 12 pounds, but still it will only weigh only about one-third that of the cast-iron box which it is intended to supplant. The steel boxes are practically indestructible, and it is claimed that they are of such uniform size that no labor is required in fitting the brasses to them.

The box resembles more nearly than any other the design of American journal boxes, and it can be readily seen from what has already been accomplished in the present case that the master car-builders' standard journal box can be made of pressed steel plate without any special difficulty. All presses used in this work are of special design, and hydraulic power being found too slow, mechanical movements have been brought into use.

STRUCTURAL IRON AND STEEL.—A Cincinnati lumberman, who is quoted by the *Timberman*, recently said that the trade in white pine has diminished one-third within six years. A large proportion of this falling off is charged to the decrease in the lumber supply, but a part of it is also attributed to the widespread substitution of iron or steel girders for wooden joists in the better classes of buildings, and of iron or steel for the framework of office buildings, hotels and other gigantic edifices. Of course the expense is greatly augmented, but the security against fire afforded by iron or steel makes the premises more valuable, and consequently more popular with tenants, at increased rent-rates. Here, in Chicago, says the *Journal of Commerce* of that city, where one office building consumes 25 miles of beams and girders, lineal measure, the enlarged consumption of iron or steel becomes an important feature in the metal trades, and business at furnaces and foundries is correspondingly enhanced. But it is not in the larger cities alone that iron is being substituted for wood, nor in edifices only. It enters now almost universally into other structures, such as railroad cars and ties, bridges and viaducts, and its use is gradually extending into other departments of the building trades. The result is increased enterprise in mines and at furnaces and foundries. Careful estimates show that within ten years past the consumption of iron has doubled, outrunning the growth of population at least 75 per cent, and on this fact, and the enormous ratio at which public and private enterprises are daily increasing, are based the present and future prospects of prosperity in the manufacture and demand for iron and steel.

MARVELS OF MECHANICAL SKILL.—Among the marvels of human skill and ingenuity exhibited by the London Mechanical and Scientific Society may be mentioned an instrument loaned by the great Armstrong Gun Works which accurately measures thicknesses down to the one-thousandth of an inch; a similar instrument by a rival mechanic which grades thicknesses one-millionth parts; a scale by Gartling, the world-famous balance-maker, which turns with the one-thousandth of a grain while loaded with 3000 grains; and an engine by a Paddington watchmaker which contains 122 pieces, not including 33 bolts and screws, and can be hidden in a lady's No. 7 thimble.

TESTING BOILERS by hydrostatic pressure is certainly not an ideal way of doing that work, and many boilers have been injured by that process. It brings an excessive strain on the boiler, and that does the boiler no good. It has been known to break off braces and tear plates. It may be argued that these are defects that should be noted, and that is all the test is for, but the boiler is never subjected to these strains and is weakened in consequence of them. Certainly a thorough internal inspection should accompany each hydrostatic test.

FOAMING IN BOILERS.—In cases of foaming in boilers it is recommended to close the throttle and keep it closed long enough to show the true level of water. If the level is sufficiently high, feeding and blowing will usually suffice to correct the evil. In the case of violent foaming, caused by dirty water, or change from salt to fresh, or vice versa, in addition to the above action, check draught and cover fires with fresh coal.

FINE SOLDER is an alloy of two parts of block tin and one part of lead. Glazing solder is made of equal parts of block tin and lead; plumbing solder, one part of block tin and two parts of lead.

BLACK JAPAN FOR METALS.—Two ounces of asphaltum and five of umber, mixed with a quart of linseed oil, is said to produce a first-class black japan for metals.

SCIENTIFIC PROGRESS.

THE DISCOVERY OF GUN COTTON.—Usually important discoveries are the result of the expenditure of much skill and labor, but they are quite as often the result of the merest accident. Nearly every one is familiar with Goodyear's discovery of vulcanizing rubber and the late discovery of saccharine, but it is not generally known that accident led to the discovery of gun cotton. In 1846, Bottger and Schonbein had a laboratory in Frankfurt, where they also gave instructions in chemistry. They resided with their families in the building where the laboratory was located, and Mrs. Schonbein, being very economical, would gather in any odd material found lying about the laboratory. It so happened one morning that a lot of oakum, used in wiping dishes, similar to the present use of sawdust, was found by the careful wife, who directed a domestic to wash and spin it at night as a recreation after a hard day's work. This young person by some accident fell into the embrace of Morpheus, and Mrs. Schonbein, awakening late at night and finding the light burning, rushed into the room with a candle in her hand to see what was the matter. In bringing the flame a little close to the oakum on the spinning-wheel, a terrific explosion took place, and persons appearing on the scene found both mistress and servant in a fainting condition. Upon investigating the cause next morning, it occurred to Schonbein that the oakum had been used to clean a large dish containing sulphuric acid and potassium nitrate employed in illustrating an experiment. The acids had converted the impure cellulose oakum into pyroxyline.

THE MUSICAL SENSE IN ANIMALS. — The higher animals can also enjoy themselves, as my house cat shows when she comes at the playing of the piano to sit by the player and sometimes jumps into her lap or on the keyboard of the instrument. I know of a dog, too, in a family in Berlin, which comes in like manner when there is music, often from distant rooms, opening the doors with his paw. I knew of another dog, usually thoroughly domestic, which occasionally played the vagabond for love of music. Whenever the semi-annual mass was celebrated in the city he could not be kept at the house. As soon as the so-called Bergknappen, which was accustomed to play at this time in the streets, appeared, he would run away and follow them from morning till evening. Evidently neither cats nor dogs, nor other animals that listen to human music, were constituted for the appreciation of it, for it is not of the slightest use to them in the struggle for existence. Moreover, they and their organs of hearing were much older than man and his music. Their power of appreciating music is, therefore, an uncontemplated side faculty of a hearing apparatus which has become on other grounds what we find it to be. So it is, I believe, with man. He has not acquired his musical hearing as such, but has received a highly developed organ of hearing by a process of selection, because it was necessary to him in the selective process, and this organ of hearing happens also to be adapted to listening to music.—*Popular Science Monthly.*

STEAM TO PUT OUT FIRE.—The use of steam as the means of extinguishing fire is not new, and its advantages in point of convenience, and, for that matter, of efficiency over many other commonly practiced methods, have frequently been given prominence. There have, however, says the *Engineering and Building Record*, been cases where the method has failed completely, and much damage and disappointment has resulted, leading eventually to serious questioning whether steam really deserved all the praises bestowed upon it as a fire-extinguisher. It will, therefore, not be amiss to direct attention to the very important circumstance that the conditions essential to the success of the method are occasionally wholly ignored, and in cases of failure to act efficiently, the causes generally are difficult to find. The prime requisite of success is that the space in which the fire is burning should be inclosed, so that free access of air is cut off, and steam under pressure and in ample quantity can be let into the apartment. It must be borne in mind that the efficiency of the steam in extinguishing fire is due simply to the fact that the vapor displaces the air, and, with it, the supporter of combustion, atmospheric oxygen. If this circumstance were given due thought, there would be less disappointment and fewer heavy losses where steam jets are depended upon for fire protection. The whole secret of success is in the correct application of the simple principle we have stated.

ARTIFICIAL RAINFALL.—Two thousand dollars has been appropriated by Congress for investigation by the Department of Agriculture of the subject of artificial production of rainfall. Col. Caspar, of the Signal Service, says: No doubt there is plenty of moisture in the atmosphere at all times, if only it could be gathered in the right place and be made to fall upon the earth. Man has accomplished as difficult things as that in the realm of applied science. It is not contemplated to produce rainfall by the slow growth of forest in the arid regions. The success of that method is still disputed. It is proposed to find out whether rainfall cannot be produced by electricity, dynamite explosions or other mechanical agencies. Taking the one from the fact that heavy cannonading on a battle-field or a Fourth-of-July celebration is usually followed by copious rains, the experimenters will work accordingly. The process of burning powder to produce rain has hitherto been too expensive to warrant its general use, but possibly cheaper explosives will be found. It has been proposed, among other things, to attach 25 pounds of dynamite to a toy balloon, and then send a flock of such balloons into the air with lighted fuses attached.

FOAM.—Lord Rayleigh, in a recent lecture at the Royal Institution, took for his text the word "Foam," and he proved by many interesting experiments that foaming or frothing is not possible with a liquid of pure constitution. Thus, neither pure water nor pure alcohol will foam; and a mixture of water with 5 per cent of alcohol will foam strongly. Beer is, of course, a mixture of this character. Water impregnated with camphor, or with a small quantity of any colloid substance, will froth freely, and we all know that a little soap added to water will cause the same effect. Alluding to sea foam, the lecturer said that this was not due to the salt contained in the water, but rather to the sea-weeds which suffered destruction in stormy weather. He also alluded to the effect of oil upon troubled waters, and pointed out that although in the first instance only the smaller ripples were affected by the oily coating, the larger waves were afterward brought under control, for it seemed as if the power of the wind to create those large waves was due in great measure to the small ripples which formed at their back and gave the wind a hold on the water which it would not otherwise have. It was in reality the curling tops of the waves and the broken water which was mischievous, and this was quieted by the action of the oil.

SOUND AT DIFFERENT ANGLES.—In some recent experiments on the range of human hearing, the ticking of a watch was distinctly audible at a distance of ten feet on a line at right angles to the head. On moving the watch 15° in front of the line, the tick could be heard 14 feet away; at an angle of 40°, only six feet; and at 55°, only three feet. Placed 25° back of the line, the watch could not be heard beyond six feet. The total range of hearing was about 95°, the direction of greatest acuteness being 15° in front of the imaginary line through the ears. Descending from the horizontal, the hearing distance increased from 10 feet to a maximum of 12 feet at 35°, and then decreased until reduced to three feet at 50°. On carrying the watch upward, the sound decreased steadily until at an angle of 60° it could be heard only three feet away.

STENOGRAPHY AND THE TELEGRAPH. — A steno-telegraphic system was tried for the first time in the Chamber of Deputies, Paris, France, recently. It is the invention of Cassagner, a civil engineer. The instrument makes possible the transmission of short or long hand reports of speeches any distance, as they come from the desk of the writer, at a much greater speed than has ever been reached. By this system, 25,000 words were transmitted to Brussels, 18,000 to Lyons, and 15,000 to Marseilles. The rate was 180 to 200 words a minute, while 100 to 120 words are ordinarily sent in the same time.

A LONG HELIOGRAPH LINE connecting 25 stations, and in all over 1000 miles in length, has been in successful use this summer from Fort Stanton in Mexico to Whipple Barracks in Arizona, between mountain peaks 40 to 45 miles apart, using a mirror about four inches in diameter with an intercepting shutter. It has been demonstrated that the instrument is quite effective over distances as great as 95 miles.

MIND AND BODY.—Between the intelligence and the hand there is a correspondence so delicate, so minute, that it bears one of the stronger evidences of the wisdom of our Maker. The versatility of the mind in its operations can never be measured; nevertheless, the flexibility of the hand is such that it fully corresponds with the versatility of the mind.

THE EYES OF INSECTS are immovable, and many of them seem cut into a multitude of facets, like the facets of a diamond. Each of these facets is supposed to possess the powers of a true eye. Lenenhoeck counted 3181 of them in the cornea of a beetle, and over 8000 in that of a common horsefly.

POPULATION OF CHINA.—Recent very trustworthy calculations of the population of the Chinese Empire by Russian authorities reckon it at 382,000,000, and the annual increase at 4,000,000. Not one in 10,000 ever heard of the religion of Jesus Christ.

A METALLIC NOVELTY.—There has been found a direct compound of nickel and carbonic oxide, as a colorless liquid, volatile at ordinary temperatures. The metal itself can be obtained from it in the form of brilliant metallic mirrors.

THE EYES.—It is a well-known fact in science that the eyes are more the epitome of the man than all the other features that may help to suggest character.

THE LONG-DISTANCE TELEPHONE SERVICE has been made so efficient that the roar of Niagara Falls can be heard in New York over the lines.

GOOD HEALTH.

THE EAR.—No oily anbetance, poultice or liniment should be pat into the ear, because great injary is liable to be done. Warm water is tha best possible and about tha only safe "wash." Do not scratch the oars with any metal; pin-heads, hair-pins or oar-picks should be tabooed. Do not scream if an insect antors the ear; warm water will drown it and wash out the "remains." The ear is not nearly so liable to injury from the intruder as from frantic efforts to dislodge it. Do not put anything cold into the ear; even cold water should be avoided, especially if there is any affection of the hearing. Do not put cotton in the ears if there is any discharge of pus from them. Use warm water as frequently as may ha necessary to keep them clean, but do aot force the foul matter back into the delicata machinery. If any small hard anbetance falls into the ear, do not attempt to "dig it out." If not readily removable, allow it to remain in quiet, and have a physician taka oare of it when convenient; it is not likely to do any serious harm unless tampered with. Anything which is soluble may be washed out, with a little patience, by the use of a syriage and warm water; if not soluble it is harmless. Deafness may sometimes be caused by an excess uf ear-wax, which has become hardened and obstructs the action of the membrane. Either have a osreful hand spply warm water through a proper syriage, or a piece of cotton wadding wet with essence of peppermint may bo introduced, which will dissolve aad absorb the hardened wax in a few hours.—*Hall's Journal of Health.*

FACTS ABOUT THE BRAIN.—In an article in the *Popular Science Monthly*, Dr. M. A. Starr says that there aro many interesting facts which make one believe that the greater the extent of brain surface in a man, or, to put it a little differently, the more the folds and deeper the cresses between them, the greater is the man's mental power; and just here it becomes apparent that to judge of the extent of the entire brain surfaco by the eize of the bead, or by the extent of the saperficial irregular surface which is covered by the skull, without any regard to the number of folds or their depth, is to fall into an absurd error; and here we begin to see how baseless the old phrenology really is; for a little brain with many deep folds may really, when spread out, have a larger aarface than a large brain with a few shallow folds, and a so-called bump or elevation on the apparent surfsce of the organ, even if it produces a correspondiag elevation on the head, which it frequently fails to do, will indicate nothing regsrding the number of folds or the depth of the creases which lie abont it; so that it may be stated without beeitation that from the sizs or shape of the besd no conclusion whatever oan be made as to the extent of surface of the brain, and consequently no conclusion can be reached regarding the mental capacity.

DIPHTHERIA is as old as olvilization. Homer mentions it aa attacking the armies of Ulysses. Hippocrates, the father of medicine, Celsus, Sydenham and others, from the dawn of medical history, have described it under many different names. In the Middle Ages it was known as the Malnm Egyptioum. The earliest medical records of this country describe it as the putrid sore throat of New England. Yet during all those ages that it has prevailed, no one has known its cause. Why diphtheria attacks the tonsils and mucous membrane of the pharynx is easily understood. Diphtheritic germs have the power to live wherever filth is found. Winter's cold does not destroy them. They float aronnd in the air, are breathed in, and lodge on the tongne, with its heat and moisture to revive them. The saliva furnishes the alkaline medium they require to propagate in, and washes them into the little orifices and orypts or pockets in the tonsils, where they receive warmth, moisture and food at our expense, and the absorbents in the tonsils are royal highways, through which they ead their poison to the citadel of life.—*Ex.*

SOME PEOPLE ARE ALWAYS SICK. Their homes are apothecary shops of patent medicines. There is no end of lotions and pills and liver regulators. There are tonics for the nerves and purifiers for the blood, and the devil knows what for the Lord knows what; and the more they take the more they think they have to. So they go complaining through life with a medicinal flavor in their breath and a tinge of death in their features. Nine times ont of ten if they would "throw physic to the dogs," raise the windows of their bedrooms to plenty of fresh air, take proper exercise, and above all bring their spirits into harmony with the divine law of health, they would find the boon which they seek in a much quicker and far more satisfactory way.—*Ex.*

WHERE THE YELLOW FEVER CAME FROM.—At the Medical Congress of Cuba, Dr. Lyada read a paper on yellow fever, which disease he affirms not to have existed in Cuba before the African immigration.

SMOKERS will be glad to hear that tobacco may be enjoyed to any extent without injury to health. Dr. Gautrelet of Vichy has discovered that by inserting in the pipe or cigar-holder a piece of cotton wool steeped in a solution of pyrogallic acid, all the ill effects of nicotine will be neutralized. The mischief frequently caused to heart, mouth and nerves is thus prevented, while the taste of the tobacco remains unaffected.

PROF. FOSTER of Breslau states that 300 cases have come under his notice in which the eyesight has been affected by the disturbance of the circulation caused by wearing tight collars.

USEFUL INFORMATION.

A MINE OF BEESWAX.—Beeswax is an article of commerce which it is generally supposed is furnished only by the "busy bee," but one of our Oregon exchanges gives the following account of a beeswax mine in that country: No one has ever been able to give an authentic account of how such enormous quantities of beeswax came to be deposited on the beach near Nehalem. Specimens are found along the beach in various places, but it is most plentiful near the month of the Nehalem. As the sea shifts the bars, pieces of it are washed ashore, and large quantities are found by plowing in some of the low land near the beach. There are spots where the sea has never reached in the memory of the oldest settlers, and which are covered with a good-sized growth of spruce, where deposits of wax may be found by digging. Specimens of the wax may be found at the house of any settler on the beach, and to all appearances it is genuine beeswax. Several tons have been unearthed, and one man shipped a large amount to San Francisco once, for which he received $500. In quality it is as good as any in the market, and has retained its familiar odor through all its rough usage and age. It is supposed by some, and so stated, that it came from a wreck of a Spanish vessel over a century ago. Others say it came from a wrecked Chinese junk. These traditions in regard to the wrecks come from the Indians and are not reliable. It is most probable that this beeswax is really "lost treasure," which people are digging for on the Nehalem.

THE UPS ON RAILROADS are unknown in Europe. However much workmen may incline to annoy other enterprises in order to secure what they think are their rights, railroad employees seek other methods to right their wrongs. This immunity of railroads from labor disturbances, whether they are Government roads or the property of corporations, is due to the fact that such roads are considered a part of the public domain, and their regular operation must not under any circumstances be interfered with. Any disturbance of railroad traffic leads to such a widespread injury to the entire public that any such interference would be regarded as so great a public disaster that no organization would presume to precipitate it. The only remedy which railroad employes in Europe ever resort to is an appeal to some public functionary, such as a minister of public works or the nearest approach thereto, which officer always gives the complainants a careful hearing, and if he thinks the complaints are just, acts at once as a mediator between the employes and the Government or corporation. In the light of the frequent difficulties of this kind which occur in this country, it has become almost imperative that some such system should be adopted here.

HOW TO WASH WOOLEN SHAWLS.—The following is a Scotch method of washing woolen shawls: Scrape one pound of soap and boil it down in water. When cooling, heat it with the hand; it will become a sort of jelly. Add three tablespoonfuls of turpentine and one of spirits of hartshorn. Wash the article thoroughly in it, then rinse in cold water until all the soap is taken off, then in salt and water. Fold between two sheets, taking care not to allow two folds of the article washed to lie together. Mangle and iron with a very cool iron. Shawls done in this way look quite new. Use the salt only where there are delicate colors that may strike.

SPURIOUS GOLD LEAF.—English gold-beaters are having a good time just now. The Merchandise Act has almost stopped the importation of German gold leaf—a most inferior article. This stuff, even when sold at a price ranging from 3s. to 4s. per 1000, is dearer than English beaten gold at 5s. per 1000. The foreign leaf loses color and tarnishes, owing to an excess of adulteration. The English does neither. Low-priced, so-called gold leaf, hammered out in Germany, is dear at any price short of that paid for imitation gold.

AN ACID which seems to have a peculiar solvent action upon the oxides, etc., and yet leaves the metallic surface intact, is oleic, and when combined with finely powdered Venetian red and cleaning fluids, leaves nothing to be desired in cleaning and polishing brass.

CELLULOID ARTIFICIAL EYES, it is said, are cheaper than those made of glass and have a good appearance, but Dr. Meurer of Lyons states that after three or four months they are liable to cause serious irritation, probably the result of some chemical change.

THE MAN who is trying to climb up finds lots of heels above him and lots of feet behind him.

ENGINEERING NOTES.

The St. Clair River Tunnel.

Engineering science has never accomplished a more perfect piece of work than was brought to a conclusion about midnight of August 30th, under the bed of the St. Clair river. The two great shields, each 21½ feet in diameter, which have so long been steadily pushed riverward from either bank, were made to meet exactly edge to edge in line with each other, thus finishing the labor of excavation on this great work. These shields were pushed forward by 24 hydraulic rams each with a piston area of eight inches diameter, capable of exerting a pressure of 125 tons per ram. The greatest pressure which had to be used was only 40 tons per ram, or 960 tons on the shield.

The tunnel proper is 6050 feet in length; with its connecting open approaches the length reaches about 28,000 feet. The work of excavation was completed in a few days over one year. The expedition and perfection with which this work has been done has beaten all previous records. It is in contemplation to put another tunnel through near by and on a parallel line.

This underground and sub-aqueous passage between the United States and Canada constitutes the longest river tunnel in the world, and will be of inestimable value to shipping interests, and it solves a heretofore difficult problem in transportation. The disadvantages of a bridge across any of the waters which connect the West with the eastboard have been so plainly apparent that, despite the great necessity for a passage, such a bridge has never been built. The tunnel removes all difficulties, as it affords a passage without offering the least obstruction to shipping.

The completion of this tunnel will have a marked effect on trade between Canada and the West and Northwest, as it reduces the time en route, and removes that obstacle to the fast moving of freight, ferry transportation. The private company which carried out this great work deserves all commendation. It was built under the supervision of the Canadian Government—has no double in the world, and in many ways is a marvel of engineering work and skill. The success of this work and especially of the Hudson river tunnel if brought to successful termination, will be the construction of tunnels instead of bridges hereafter as connecting links of communication over all great navigable waters of reasonable breadth.

The Niagara Water-Power Scheme.

Active work upon this enterprise will be begun at once by contractors Rogers & Clement. About 200 men will be employed at the start. Three 10x20-foot shafts will be sunk to the level of the tunnel, and from them a heading will be run each way. Over a mile of tunnel is to be completed within 15 months. Consulting engineer Coleman Sellers is now abroad conferring with Sir Wm. Thomson and other distinguished engineers with regard to plans for the economical development and transmission of the power.

The company has secured a large area of land (several square miles) on the Niagara river, beginning a mile and a half above the falls, and all rights of way for carrying a tunnel under Niagara village to a point below the falls.

The general plan is to construct a tunnel about 27 feet in diameter from a point below the falls to the upper limit of the secured property.

This tunnel will have lateral branches at a depth of about 100 feet from the surface, into which will be sunk numerous vertical shafts at the points where power will be required. A system of surface canals will bring the water of the river to the heads of these shafts, and its action on turbines at the lower ends of the shafts will develop the power, estimated, we believe, at about 150,000-horse power. The amount of water diverted for this purpose will be a small fraction of one per cent of that going over the falls.

UNDERGROUND CONDUITS. — Doubts have frequently been expressed in regard to the success of the steam-heating system of New York. In alluding to this matter the *Steam Fitter*, in a late number, gives a graphic account of how gas, electricity and steam get tangled up in conduits. The heat from the steam causes fetid odors, the gas mains leak, and electric wires fire the accumulations of heated gas vapor, and explosions occur. Private interests ride over public safety and comforts, and ont of it all comes the conclusion that a modern city is an accumulation of blunders, one in a measure to want of information respecting new things and a disregard of public rights.

THE SEVEN ENGINEERING WONDERS OF THE WORLD.—The "Seven Modern Engineering Wonders of the World," as described by Arthur V. Abbott, are: The new Forth Bridge, Scotland; the Eiffel Tower, Paris; the new Croton Aqueduct, New York; the blowing up of the Hell Gate obstructions, New York; the Eads Jetties at the month of the Mississippi; the St. Gothard Tunnel, Switzerland, and the Brooklyn or East River Bridge.

UTILIZING THE POWER OF THE MISSOURI.—The Missouri Power Company are building a gigantic dam across the Missouri river near Helena, Montana, for the purpose of utilizing the power of the water. The dam is a timber crib structure 800 feet long and 47 feet high, and the reservoir obtained by its means will cover an area of 20 miles square. The water will be led along a tunnel to the turbines, which will, it is expected, generate 20,000 horse power, and the power thus developed will be transmitted, electrically, to the mills, etc., at Helena.

ELECTRICITY.

AN ELECTRICAL FURNACE.—It is by no means impossible that electricity may ere long be applied to smeltiog furnaces. In an electrical furnace recently patented in England, instead of using movable electrodes of metal or carbon, the inventor uses block cylinders of carbon secured in metal cases and placed opposite each other in the walls of the furnace. The metal cases containing the carbon are kept cool by a circulation of water within them. These block cylinders or electrodes are fixed while the furnace is running, only needing to be pushed farther into the furnace to compensate for wear. Rods of metal or of carbon are used to establish the electric circuit through the furnace, which rods are passed through holes in the furnace. In starting the furnace when charged and required to be ran, these rods are pushed through the holes in the furnace and across the furnace until those of one side meet those of the other, and through these rods a current of electricity is passed which creates a high state of incandescence, and thereby establishes a passage for the current in the mass of material in the furnace. Means are provided in the furnace for the escape of gas and for the introduction of the charge, and also for varying the electromotive force of the current across the furnace according to the varying resistance of the charge.

ELECTRIC LOCOMOTION.—The Lynn & Boston Railroad Company are changing from horse to electric motive-power. The president of the company says it costs $1.25 per hour to run electric cars, while with horses the expense is $1. The electrics will run eight miles per hour and horses six. This equalizes the expense. Plans have already been maturing for extending the electric line over the Salem turnpike, using the power of the West End Company in Chelsea and Boston. Twenty new cars will be immediately added to the rolling-stock. The road now has 300 cars. The town of Wrentham, some 20 miles south of Boston, is also soon to be connected with that city by an electric road now running from South Wrentham to the Attleboros and which is being pushed on still farther south to Providence. Other electric lines are also in contemplation to connect the great New England city with Woonsocket, in Rhode Island, and with Milford, the Medways—east and west—and many other towns in line with those routes. Electric locomotion has evidently come to stay on local, short railroad lines. The next step will be to apply it to trunk lines. Such seems to be manifest destiny.

ELECTRIC TRANSPORTATION OF LETTERS — Buenos Ayres, in South America, seems to be fully alive in the way of progression in electric devices. The people of that country are devising a scheme for an overhead wire railway for the transport of letters and newspapers between Buenos Ayres and Montevideo, which is to go into operation shortly. A company has contracted, it is said, to erect two overhead wires, a distance of 156 miles, so that traveling boxes can be dispatched every two hours from the capital of Uruguay to that of Argentine. At the La Plata estuary, which is about 19 miles wide, the wires will be supported on each side of the river by two towers 87 yards wide.

ELECTRIC BELT RAILWAY FOR LOS ANGELES. A telegraphic dispatch from Los Angeles of Sept. 21st said: It is expected that an application will be made to the City Council at its meeting to-morrow, or one week from to-morrow, for a franchise for an electric belt railway to pass through and around the city. Among the projectors are General M. H. Sherman and Col. O. B. Carr, both of San Francisco. Should the franchise be granted, as it is thought it will be, it is proposed to expend a million and a half of money on its construction work during the next 12 months.

ELECTRICITY IN THE BAKERY.—Of novel applications of electricity there is no end. Bakers are now using the electric motor as a broad-mixer, and are thus enabled to do in four or five minutes an amount of work that would otherwise require hours of hand labor. A writer in a medical paper says he has frequently obtained much relief from facial neuralgia by applying an incandescent light to the part affected.

A NEW ELECTRIC WIRE.—The French post-office has decided, after exhaustive experiments, to adopt for its telegraphic service, in place of the present iron wire, a new wire known as the "bi-metallic Martin," composed of steel with a surface of copper. It will also be employed upon the telephonic system in place of the present bronze wire.

THE SUPREMACY of the English in the application of electricity to the propulsion of vehicles is likely ere long to be disputed in this country. A company is being organized in Pittsburg to operate electric cabs, the current to be furnished by storage batteries.

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[NEW THIS ISSUE.]

Gates Ore and Rock-Breaker—Pelton Water-Wheel Co.
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Delinquent Sale Notice—Gray Eagle Mining Co.
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Dividend Notice—Pacific Borax, Salt & Soda Co.

☞ *See Advertising Columns.*

Passing Events.

A rainfall on Sept. 30th, quite general over the State but nowhere exceeding half an inch, constituted the notable meteorological event of the past week. Some harm was caused by this unseasonable rain to the grapes still on the vines, to the raisin-crop in process of curing, and to sacked grain exposed in the fields or elsewhere, as there always is a good deal no matter how late the rains hold off. The dry grass, about the only pasturage left at this season of the year, has also suffered some in certain localities.

The above rain not having affected the stage of water in the streams, the work of the river-bed miners has not been interfered with, the prospect now being that they will have a prolonged and prosperous working season. The quartz, drift and hydraulic miners, having been favored with a good water supply, have been able to prosecute their operations with less interruption than usual. As a rule, the reports that reach us from all parts of the mining regions are favorable, the prospect being that the present year will see the largest bullion production ever made on the Pacific Coast, a result due in good part to the improvement that has during the past few months taken place in the prices of copper, silver and lead. Our miners are to be congratulated on the era of prosperity that evidently awaits them.

The English as Mine Investors.

Clearly we have in prospect some, if not a marked, revival of mining on this coast. The business here has in fact been undergoing visible improvement for the past year or more. With this improvement there comes an increased disposition to invest in this class of properties. Such being the case, it is opportune to consider some of the causes that have heretofore led to disaster in mining ventures in this country, more especially among the English and other foreign investors.

That we much need this foreign capital to aid us in opening our mines and bringing them into a condition for active production, cannot be denied. That it requires some little assurance to go to these capitalists and ask them to put their money into our mines, after their past experience, must also be conceded; nor will it probably go far toward reconciling them to the losses they have suffered, should we be able to demonstrate that these losses were due to causes operating on their side of the water as well as on ours.

An American, however valuable the mine he is seeking to dispose of or however strong his backing here, cannot successfully float his property in London without the aid of local promoters. Going there, he is compelled at the very start to give these promoters a large interest in the enterprise and then surrender to them the whole after-conduct of the business.

This done, the owner of the property is himself relegated to the background, except in so far as he is forced to a rigorous compliance with the terms of his contract with these amiable and accommodating but very sharp gentlemen. When there come to be the fees of experts to be paid and other preliminary expenses met, he is permitted to figure conspicuously in the program, but in arranging the figure-heads and roping in the public, this is all engineered by the promoter.

Occasionally it has happened that an American adventurer has, unaided, succeeded in palming off on the British public a worthless mine, but rarely has this happened. Lately, several operations of this kind have been effected in London to the surprise of observers on the Pacific Coast, where the properties sold are located, all being here considered of little value. A transaction of the kind could not be carried out here nor anywhere else were proper precautions observed. If, therefore, the foreign investor has in this instance been deceived and imposed upon, it is his own fault, and he should not complain, as he has only now met with a mishap that sooner or later was sure to befall him.

The negotiating of mining properties in London, while often ending in disaster to the Englishman, proves at the same time very tedious and annoying to the American. While London, for the reason that it is the great center of capital, is a good market, it is nevertheless a very slow one.

The American seeking there a sale of his mine is first asked as to who are his bankers. Then, the property offered being found satisfactory and attractive, comes up the question of its availability. This settled in the affirmative, interpose the usual causes for delay.

Perhaps it must be laid over the summer or the Christmas holidays. Perhaps the expert or engineer who is to visit it in the interest of the London promoters is in India, Africa or South America. If he is at hand, the American must deposit a guarantee to cover his fee and expenses in going to verify the accuracy of the reports already submitted. If the property will not bear the addition of a fortune to the price which the vendor is willing to accept, the negotiation will not have progressed so far as this, if he have had the good-fortune to fall into the hands of the better-class of English operators.

With the American going to London on this sort of errand, we would say, then, the business works something like this: If you are so introduced as to get into first-class channels, if the local conditions are favorable to offering your property to the public at a price that to you appears enough to sink it; if your disposition and ability to take, say $5000 worth of further preliminary chances are good, and if the London promoters are ready to start their examining agent all within three months after your arrival in London, then you are doing well, 12 months being nearer an average. You may content yourself for the next two months awaiting the report of the expert.

That report may be favorable, with qualifications and conditions which may be arranged within another six months. If so, you are doing well. Meantime, if you are representing your own property, you are worn out by delays and probably return home with a better appreciation of your own property and your own country. If you are an agent, your principal is probably out of patience and recalls or refuses to renew your authority to sell. If neither of these misfortunes overtake you, and terms of sale are finally agreed upon, you probably find your cash profits invested in your expense account, and that your visible profits consist of certain "vendors' shares," which in order to market, you must now remain in London. Most Americans do not fare as well as this. For the reason that London is so slow, the best American properties do not seek that market. Most Americans are patient when expecting to receive as reward twice the value they would accept on promptly executed sale.

It is often said that the English have fared badly in American mines. Have they not fared as well as Americans would if they went about buying them in the same way? The usual inquiry for the English market is for "*a going concern.*" This is imperative. It must be a large property, for the English promoter has a sense of consistency, as a rule, which will not permit him to raise the price of a $50,000 property to $300,000, though he would not hesitate to float the same property at $800,000 if it came to him at half a million.

Englishmen either cannot or will not see that the great profits of mining investment arise from buying *right*. Our successful mining men have made their money by developing mines from "prospects," and the English should learn to do the same.

The English have gone to South Africa and invested largely in tracts of mineral land for development. These ventures will eventually prove the best mining investment ever made by them, if Africa is the gold country it is said to be. But when these same people cross the Atlantic, they must have a mine with a record of profitable operation. It would seem as if a premium were offered to the owners of mines of glorious record to seek a market for the nearly empty shell. The value of a mine is in its future always. A whole mining district of undeveloped mines may be bought for the price asked for one of these empty shells. Perhaps the English will in time become as cosmopolitan in the matter of mining investments as they now are in the matter of marketing their manufactured goods.

Indeed there are signs that this will soon be the case. That people have lately, in the purchase and equipment of the Dalmatia mine at Kelsey, El Dorado county, set the example of beginning at the beginning, of making a mine instead of buying one already made. They have also led off there in being the first mining company on this coast, if not in this country, to avail of the electric motor for the transmission of power from its original source to the point where required for the propulsion of machinery. If the English have something to learn of us, we have also something to learn of them. This faculty of learning and teaching at the same time is one of the things that have tended to insure the greatness that distinguishes both these peoples.

SHIPPING OUR CHEAP PRODUCTS.—Fifty tons of infusorial earth were shipped from this port to New York the past week. We have in California enough of this material to supply the wants of the whole world, could it be delivered at points where needed without too great cost, it being a cheap article and nowhere commanding a high price. It is used, often under the name steatite or diatomaceous earth, for polishing metallic surfaces, lining safes, etc., being a good resistant of heat.

LITTLE MINING NEWS TILL THE CRISIS IS PASSED.—The newspapers in the mountains are just now engrossed with political matters to the almost entire exclusion of mining news, and so it will be till the coming election is over and the country saved or lost, as the case may be.

Stockholders' Interests.

The careful, conservative but close observer of the signs of the times must discern much which gives encouragement to the belief that the interests of stockholders in mining property are to have due consideration in the near future.

One of the first, and perhaps the most important, is the higher price of silver. This advance is inducing more thorough and extensive prospecting work in the Comstock mines than for years past. As the work progresses the attention of large capitalists is being drawn to the lode, and as they become more thoroughly identified with the mining interests in that district there can be no doubt but their keen perception of what is right will cause them to inaugurate the many needed reforms in mine management so persistently advocated by the MINING AND SCIENTIFIC PRESS.

Another favorable sign of the times is that our efforts are being seconded by other journals, not only at home but also at the East. The most gratifying evidence at home of this is witnessed in the Reno (Nevada) *Gazette* republishing, with commendatory remarks, our views on mine management as expressed in an editorial in the MINING AND SCIENTIFIC PRESS of Sept. 13th. This was republished from the *Gazette* by the Virginia City *Enterprise* of Sept. 25th. By giving such ideas a wide circulation as the above-mentioned journals have endeavored to do, we can reasonably look for good results. In the editorial of Sept. 13th favorable mention was made of Hon. F. G. Newlands, which could have been further enlarged by stating that several months ago he made an address to the farmers at Carson, Nevada, on the water-storage question. The subject-matter of the address was a contention on Mr. Newlands' part that with the water properly controlled there would be sufficient in the driest season not only to mature the crops of the farms, but supply motive-power for the ore-crushing mills on Carson river. In his remarks he said that henceforth ore would be milled at $5 per ton. The reduction of ore-milling to $5 per ton is another reform made by Mr. Newlands in behalf of stockholders. If other mine managements would give careful heed to stockholders' complaints and second a few of the reforms made by Mr. Newlands, there would be less cause for complaint and it could be asserted that a mining-stock millennium is near at hand.

Another good sign is the late decision of Judge Levy of the Superior Court in the case of the Benton Consolidated Mining Company. In this case the evils of the dummy-director are most graphically portrayed. By this decision the public is made aware that the dummy-directors of the above company obtained through fraud 83,000 shares of the company's stock at assessment sales, and then resold it to the late Seth Cook, to whom it is said they were indebted, by proxies or otherwise, for their positions of trust. These same dummy-directors, when brought before the bar of justice for their fraudulent acts, pleaded the "baby (limitation) act," but Judge Levy informed them that "fraud" did not run in that direction. As a result, they will be forced to pay to the stockholders all the money involved in the fraud.

Similar suits against other mining corporations would develop the fact that the stockholders in the Benton Con. Mining Co. are not the only persons made to suffer from this assessment scheme. It is claimed by those in position to know that more than 30,000 shares of Consolidated Virginia changed hands in a similar manner just before the mine commenced to pay dividends in 1886-87.

Personal.

Mr. Charles G. Yale, associate editor of this paper, left a few days since on a trip to the Atlantic States, in the course of which he will visit his native State, Florida. Later on, Mr. Yale will journey through the mining regions of the "New South," and thence on through those of the Central and Northwestern States, inspecting their mineral resources, mechanisms, processes and methods of operating. Mr. Yale having had large experience in all that relates to the mines and the business of mining on the Pacific Coast, will be able to intelligently comprehend and readily appreciate all that is new or otherwise especially noticeable in his widely extended field of inquiry and observation.

An Inter-Continental Railway.

The report of the International American Conference relative to an international railway line sums up all the detailed information as to what has been accomplished in that direction. From this report we take the accompanying map of the American Isthmus showing the proposed lines for an international railway.

A glance at the map of the Western Hemisphere will show that in the north the railways of the United States extend east and west, north and south; they join those of Mexico at several points, and extend in several lines southward to the City of Mexico, whence lines have been projected to the boundary of Central America, and one is under construction. Again, in South America, railways cover the southern part in all directions, converge northward and proceed onward in a single line.

The railway systems of the United States reach the frontier at four points—Nogales, El Paso, Eagle Pass and Laredo.

At Nogales, the Sonora road extends to Guaymas, from which point another line is projected southward along the Pacific Coast as far as Mazatlan, and indeed to Guerrero, which would eventually connect it with the City of Mexico. From El Paso, which is 2456 miles from New York and 1286 from San Francisco, the Mexican Central railroad goes 1224 miles to the City of Mexico. From Eagle Pass, 2083 miles from New York and 1819 miles from San Francisco, the Mexican International to Torreon on the Mexican Central, 384 miles, and thence to the City of Mexico, in all 1091 miles, and from Laredo, 2187 miles from New York, the Mexican National, 839 miles to the City of Mexico.

The City of Mexico may then be taken as another starting-point.

The Mexican Southern has been projected from the City of Mexico through Puebla, Tehuacan, Oaxaca, etc., to Tehuantepec, and thence along the coast to the frontier of Guatemala, 768 miles. A line is already in operation 183 miles south of the City of Mexico, and the line above mentioned is under construction. A great portion is already surveyed, the remainder will soon be located, and it is believed that the construction will be completed at no distant day. A branch was projected from Tonala to San Cristobal. That this route has been chosen to reach Central America would seem to show that it is the best. It reaches the population where it is densest around Oaxaca, and it goes from there along the route easiest of construction, except, perhaps, for the numerous bridges required from Tehuantepec southward along the coast. The elevation gradually increasing from Tehuantepec, would reach at Tapachula about 1000 feet.

From the City of Mexico there is another route. The Mexican railway may be taken to Vera Cruz, 263 miles, and then the Alvarado road to Alvarado, 34 miles, or 297 in all. This latter road has a conceselon for an extension to the Isthmus of Tehuantepec. The Continental railway, projected from Matamoras along the Gulf coast, will also follow this route south of Vera Cruz. None of this latter line has been surveyed, but for a portion of the distance there is a level strip of land between the coast and the mountains which would permit of a railway, yet the mountains at places approach the coast very closely. From Alvarado to Minatitlan, on the Isthmus, would be about 110 miles. At this point the Tehuantepec railway might be used to Tehuantepec, or a southeasterly direction, following the cart-roads into the interior to the city of San Cristobal, 200 miles farther, or 607 miles in all from the City of Mexico, and from that point the same general direction to the frontier of Guatemala. The heights on the Isthmus are moderate, but the country to the eastward has not been surveyed. As an alternative line, this would not be any more difficult of construction than the Mexican Southern; that its length is less makes it worthy of consideration, and being in the interior, it would have a healthier situation.

The coast may still be followed by the first route through the State of Guatemala. It is said that a survey is being made for a line from Guatemala City to connect with the road from Tonala, but it has not been announced yet what route it will take; however, it is probable that it will follow the coast, gradually ascending from Tapachula to Retalhuleu, meeting the railway from Champerico, thence to Escuintla, 1450 feet above the sea, which is a point on the railway from San Jose to Guatemala City. Contracts have recently been made for the extension of this latter line to Santo Tomas, making it a means of interoceanic communication. The distance from Tapachula to Escuintla is about 145 miles.

From Escuintla the line may again follow the coast through the State of Salvador to San Miguel or La Union, the distance to the latter point being about 218 miles, but there are few inhabitants along the coast, and branches would have to be built to the capital and other important cities; hence it would be better to go at once from Escuintla to San Salvador, 126 miles, crossing the railroad from Acajutla to Santa Ana at Sonsonate, then the high land can be followed through the important cities of Cojutepeque and San Vicente to San Miguel. Such a line would reach the greater portion of the population, and would be in a healthy location. The grades would not be too heavy, as shown by the elevations determined by the French expedition. The traffic of the country is carried by the cart-roads along about the same route. From San Salvador to San Miguel is 90 miles.

Taking up again the interior route at San Cristobal in Mexico, a general southeasterly direction might be taken to Totonicapan, Solola and Guatemala City, a total of about 205 miles from San Cristobal. While this route reaches the mass of the population and the fertile regions, yet the topography is such as to make construction difficult. It is mountainous, the spurs or chains running in a direction almost perpendicular to the line, with deep valleys between. However, it is again to be noticed that the distance is apparently less from the City of Mexico than by the coast route.

From Guatemala City the line may then proceed by the shortest route to the city of Santa Ana and San Salvador, whence the route previously described may be followed, or the line may go from Guatemala City to Jutiapa, and thence down the valley of the Lempa in a general direction parallel to the coast, with branches to the principal cities. Such a railroad has been spoken of by the capitalists of Salvador and has indeed been projected. A line is said to be under construction from San Miguel to La Union, which is no doubt part of the general project. The distance through this State is about 170 miles.

From San Miguel the line may go directly west over almost level ground to the river Goascoran, crossing the projected Honduras Interoceanic railway for which surveys were made as long ago as 1853, and which clearly show the nature of the country in this vicinity.

Thus to carry communication through Central America from the City of Mexico requires about 1700 miles of railway, of which 293 miles are already constructed, 790 miles are under construction and survey, and 625 still remain to be located. It is thought that the average cost of the international line from the City of Mexico through Central America would not be much greater than $37,500 per mile.

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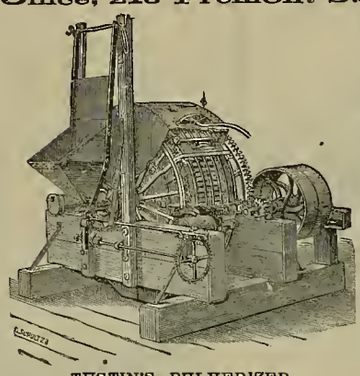

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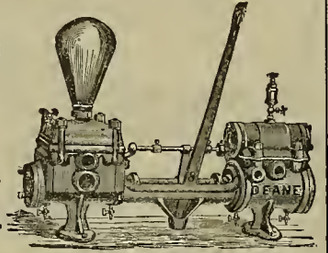

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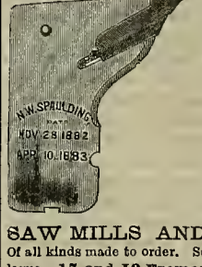
SAW COMPANY



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Stamp Mills for Wet or Dry Crushing. Huntington Centrifugal Quartz Mill. Drying Cylinders. Amalgamating Pans, Settlers, Agitators and Concentrators. Retorts, Bullion and Ingot Moulds, Conveyors, Elevators, Bruckners and Howell's Improved White's Roasting Furnaces, Etc.

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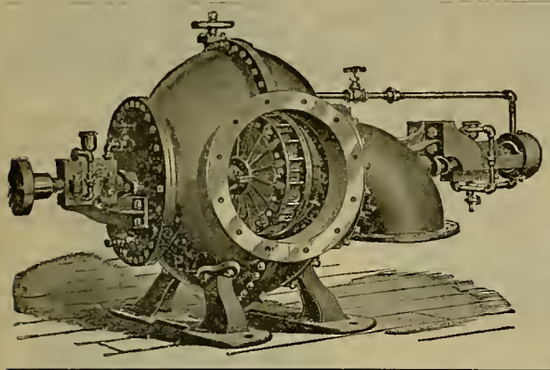

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These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

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Adapted to every variety of service, and built accurately in standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Broad and Narrow Gauge Locomotives, Mine Locomotives by Steam or Compressed Air, Plantation Locomotives, Noiseless Motors for Street Railways, Furnace Locomotives, etc.

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For information concerning this process for the reduction of Ores containing precious metals, and terms of license, apply to

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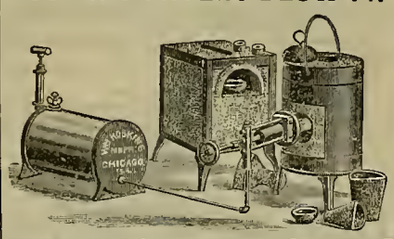

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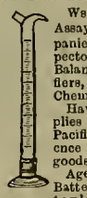

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Ores worked by any Process.
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Analyses of Ores, Minerals, Waters, etc.
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No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

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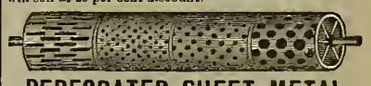

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For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

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Constantly on hand a full assortment of Manila Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice.

811 & 613 Front St., San Francisco, Cal.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 2, 1890.

General trade the past week was for a day or two interrupted by rains, but with clearing weather business has started in more active. The rains have unquestionably brougbt in more buyers from distant points.

Money in the local market is easy. Remittances are coming in quite freely from the interior, while the demand for funds is not active. Foreign imports of treasure the past week included £145,441 from Australia, and the exports included to Japan, $20,000 in Mexican dollars, $44,490 in gold coin and $1550 in gold dust.

The Tariff bill has become a law. The duty has been increased on nearly every article in the manufacturing line.

MEXICAN DOLLARS—The market has held barely steady at 88 to 89 cts. The demand is light, The decline in silver caused Chinamen to hesitate in buying Mexican.

SILVER—The market fluctuated down abroad and at the East under strong manipulation, up to yesterday (Wednesday), when an advance set in owing to the Mint being in the market for 4,500,000 ounces. Yesterday's Washington telegrams reported that silver offerings amounted to 375,000 ounces. The purchases were 225,000 ounces, as follows: 25,000 ounces at $1.390, and 200,000 ounces at $1.395. The Mint's counter rate in this city was $1.12½ an ounce, at which it is quoted to-day. Considerable silver will be offered the Department on to-morrow (Friday) at from $1.14 and upward.

The movements in silver confirmed this paper's position that the silver bill is in the interest of speculators. The Rothschilds and other powerful moneyed men will reap harvests of wealth by dealing in everything whose market price is governed by that of silver. The last depression was undoubtedly engineered by European financiers to make more favorable dealings in the regular semi-annual settlements with India interests. Besides this they were enabled to buy at lower prices the Indian rupee, the Russian rouble and the many banking and other securities affected by the market-price of silver. It is a big speculation, view it in whichever light we may. The only thing that will give us a fixed stable price is free coinage.

QUICKSILVER—Receipts the past week aggregate 144 flasks. The market is fairly firm at quotations.

BORAX—Receipts the past week aggregate 185 ctls. and exports by sea 3748 ctls. to New York. The market is quiet but steady.

LIME—Receipts the past week aggregate 4055 bbls. The market is quiet but firm.

TIN—Imports the past week aggregate 1307 ingots from Australia. The market is very dull, being between seasons. A corner is being run in pig, which makes quotations entirely nominal. Large consumers will not submit to the high prices asked. There was quite a short interest at the East and abroad for September delivery, which caused the sharp advance at New York and in London. The market closed weak and lower.

IRON—The market is steady at unchanged quotations. English cablegrams report a strong market, with an absence of any exciting speculative tendency.

COAL—Imports the past week aggregate as follows: Newcastle, N. S. W., 11,462 tons; Seattle, 693; Port Townsend, 2116; Sydney, 1,830; Coos Bay, 450; Departure Bay, 2100; Tacoma, 2000; total, 18,651 tons. The market is exceedingly strong for steam and gas coals. Of course this necessarily favorably affects house coals. Imports of Australian after this month will be almost nil, up to and after the turn of 1891. The lessened importation will be due to the labor trouble in Australia, preventing vessels loading there for this port. The Wellington collieries are turning out more coal. Large dealers are quite confident of still higher prices soon.

Eastern Metal Markets.

By Telegraph.

NEW YORK, October 1.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	.62	1 12¾	$17 00	$5 17½	$25 00
Friday	.51	11-10 1 12	17 00	5 30	25 00
Saturday	.61	11-16 1 12	17 00	5 25	25 00
Monday	.50¾	1 10	17 00	5 25	24 75
Tuesday	.50	1 09	17 00	5 37½	24 75
Wednesday	.61½	1 12¾	17 00	5 60	24 00

NEW YORK, September 30.—Lead is very firm under a strong speculative and consumptive demand. Tin, after advancing sharply, is now settling off. Quicksilver is strong. Copper is well sold ahead. Stocks here and abroad are declining under steady consumption.

Coal.

TO LOAD—PER TON		SPOT FROM YARD—PER TON.	
Australian	$ 8 00@$ 50	Wellington	$ 9 50
Liverpool Stm.	8 00@ 8 25	Greta	11 00
Scotch Splint	8 26@ 8 50	Carbon Hill	7 50
Cerdiff	8 50@— —	Nanaimo	9 50
Lehigh Lump	16 50@17 00	Gilman	8 50
Cumberland hk	13 50@— —	Seattle	8 50
Egg, hard	15 00@— —	Coos Bay	8 50
CANADIAN ANTHRACITE COAL		Cannel	12 00
Egg, ship side	$12 50	Egg, hard	16 00
Egg, yard	15 00	Cumberland, in sacks	16 00
Stove, yard	15 00	do, bulk	16 00
Nut, yard	15 00	Wallsend	10 00@10 50
		COKE.	
English, to load			$12 00@13 00
English, spot, in bulk			13 50@15 00

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T. LEVIED.	DELINQ'T. SALE.	SECRETARY.	PLACE OF BUSINESS.
Alki Cons M Co	California	1	1	Aug 28 Oct. 3	Oct 22 B B Keeler	Flood Building
Alpha Cons M Co	Nevada	5	25	Sept 16 Oct 22	Nov 11 C E Elliott	309 Montgomery st
A ta M Co	Nevada	39	50	Sept 1 Oct 7	Oct 29 L Osborn	309 Montgomery St
Best & Belcher M Co	Nevada	47	25	Aug 21 Sept 25	Oct 17 L Osborn	309 Montgomery St
Challenge Con M Co	Nevada	7	50	Sept 26 Oct 28	Nov 17 O L McCoy	331 Pine St
Goleta M Co	California	1	10	Sept 16 Oct 27	Nov 24 D M Kent	330 Pine St
Gray Eagle M Co	California	19	6	Aug 25 Sept 29	Oct 20 J M Buffington	303 California St
Guascaran & California M Co	Honduras	2	10	Aug 12 Sept 20	Oct 3 E Oliver	22 Montgomery Ave
Gould & Curry S M Co	Nevada	65	30	Sept 16 Oct 21	Nov 13 A K Durbrow	309 Montgomery St
Humboldt M & M Co	Nevada	1	1	Aug 15 Sept 29	Oct 25 J C Ruddock	35 New Montgomery St
Kentuck M Co	Nevada	22	30	Aug 18 Sept 22	Oct 14 J W Pew	310 Pine St
Locomotive M Co	Arizona	8	6	Aug 13 Sept 18	Oct 6 A H Fish	309 Montgomery St
Live Oak Drift Gravel M Co	California	12	5	Sept 9 Oct 9	Oct 31 J Morizio	328 Montgomery St
Mono G M Co	California	30	25	Sept 18 Oct 28	Dec 2 E L Burling	309 Montgomery St
Montecito M Co	California	1	10	Sept 15 Oct 27	Nov 24 D M Kent	330 Pine St
Occidental Cons M Co	Nevada	7	28	Aug 6 Sept 11	Oct 7 A K Durbrow	309 Montgomery St
Peerless M Co	Arizona	15	15	Aug 14 Sept 23	Oct 14 A Watermen	309 Montgomery St
Sterling M Co	California	1	6	Sept 16 Oct 27	Nov 24 D M Kent	330 Pine St
Silver King M Co	Arizona	4	30	Sept 20 Oct 28	Nov 18 Aug. Waterman	325 Montgomery St
Teresa M Co	Mexico	2	5	Aug 13 Sept 18	Oct 8 A Cheminant	328 Montgomery St
Weldon M Co	Arizona	3	10	Sept 9 Oct 30	A Weterman	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Nevada Queen M Co	Nevada	R R Grayson	327 Pine St	Annual	Oct 8
Paradise Valley M Co	Nevada	A Cheminant	328 Montgomery St	Annual	Oct 8
Presidio M Co	Nevada	L Orhorn	309 Montgomery St	Annual	Oct 6

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	03	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	April 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 25
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Oct 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 11.		WEEK ENDING Sept. 13.		WEEK ENDING Sept. 25.		WEEK ENDING Oct. 2.	
Alpha	1.20	1.30	1.10	1.30	1 20	1.75	1.65	1.83
Alta	1.05	1.15	1 10	1.35	1.15	1 30	1.05	1.20
Andes	1.10	1.35	1.20	2.25	2.05	2.35	2.25	2.30
Belcher	3.05	3.25	3.15	3.50	3.30	3.40	3.75	3.40
Best & Belcher	3.40	3.55	3.20	3.55	3.25	3.80	3.75	3.95
Bullion	2.50	2.75	2.70	2.85	2.75	2.85	2.80	2.95
Bodie Con	1.20	1.25	1.15	1.25	1.20	1.70	1.40	1.75
Bulwer	.25	....	.30	....	.30	....	.30	....
Commonwealth	3.00	....	2.75	....	2.75	....	3.00	....
Con. Va. & Cal	4.70	4.85	4.70	4.9	4.80	4.85	4.75	4.90
Challenge	2.25	2.70	2.50	2.60	2.60	2.8	2.55	3.10
Chollar	3.10	3.40	3.15	3.40	3 25	3.40	3.20	3.40
Confidence	6.50	5.62	6.00	....	6.75	7.50	7.00	8.00
Con. Imperial	.35	.40	.35	.40	.40	.45	.40	.45
Caledonia	.40	.50	.50	.70	.50	.55	.55	.60
Crown Point	2.70	2.85	2.70	3.10	2.90	3 10	2.75	3.00
Crocker	.20	....	.25	.30	.30	....	.25	....
Del Monte	....	....	1 10	....	1.00	....	....	....
Eureka Con	....	....	....	....	4.25	....	4.25	....
Exchequer	.95	1.05	1.00	1.20	1.05	1.25	1.20	1.30
Grand Prize	....	....	.35	....	.35	.40	.40	....
Gould & Curry	2.25	2.30	2.10	2.35	2 15	2.25	2.25	2.30
Hale & Norcross	2.45	2.65	2.20	2.50	2.35	2.45	2.35	2.45
Julia	.30	.35	.90	.95	.35	....	.35	....
Justice	1.45	....	1.40	1.60	1.50	1.55	1.50	1.60
Kentuck	1.30	1.55	1.35	1.50	1.40	1.90	1.65	1.80
Lady Wash	.60	.65	.60	.75	.55	.75	.50	....
Mono	.55	.60	.50	.55	.40	.70	.55	.60
Mexican	3.15	3.35	3.15	3.30	3 20	3.30	3.35	3.60
Navajo	.30	.40	....	....	.45	.50	....	....
North Belle Isle	1.00	....	....	....	1.15	1.25	1.10	....
New Idaho	.75	.80	.75	....	.85	.95	.80	....
Occidental	1.00	1.35	1.35	2.30	1.90	2.30	2.00	2.30
Ophir	4.85	5.12	4.85	5.0	4.90	5.25	5.00	5.25
Overman	1.15	2.25	2.20	2 45	2 20	2.3	2.15	2.30
Potosi	6.25	7.25	6.75	7.00	6.87	7.12	6 62½	7.00
Peerless	.10	....	.10	.30	.25	.30	.30	....
Peer	.10	* .25	.25	.30	.25	....	.20	....
Savage	3.75	3.90	3.55	3.90	3.50	3.80	3.70	3 90
S. B. & M	1.30	1.40	1.35	1.75	1.55	1.65	1.50	1.70
Sierra Nevada	2.75	2.85	2.75	2.95	2.85	3.00	2.90	3.25
Silver Hill	.35	....	.35	.45	.40	.45	.35	.40
Scorpion	.25	.30	.30	....	.90	....	.30	....
Union Con	2.85	2.95	2.85	3.00	2.95	3.00	2.90	3.05
Utah	.75	1.05	1.00	1.25	1.19	1.20	1.10	1.25
Yellow Jacket	3.25	3.40	3.30	3.65	3.40	3.50	3 35	3.50

* Assessment de inquent.

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 2, 9:30 A.M.

200	Justice		1.60
100	Keyes		50c
100	Alpha Con	1.6	100 Lady Wash 65c
840	Alta	1.50@1.65	100 Navajo 30c
450	Andes	2.25@2.30	50 Occidental 2.05
175	Belcher	3.15@3.20	50 Ophir 5.00
50	Benton Con	2.00	150 Overman 2.25
10	Best & Belcher	3.70	100 Savage 3.70
100	Bullion	2.80	100 Seg. Belcher 1.50
150	Challenge Con	2.60@2.55	100 Sierra Nevada 2.90
150	Con. Cal & Va	4.75	100 Silver King 35c
100	Crown Point	2.70	200 Union Con 2.85
200	Exchequer	1.20	250 Utah 1.10
100	Gould & Curry	2.20	200 West Comstock 60c
50	Julie	30c	250 Yellow Jacket 3.35@3.40

San Francisco Metal Market.

WHOLESALE.

THURSDAY, October 2, 1890.

ANTIMONY	— @	21½
BORAX—Refined, in carload lots	8 @	—
Powdered " " "	8 @	—
Concentrated " " "	7½@	—
All grades jobbing at an advance.		
COPPER—		
Bolt	23 @	25
Sheathing	23 @	25
Ingot, jobbing	20 @	—
do, wholesale	19 @	—
Fire Box Sheets	23 @	25
LEAD—Pig	5½ @	—
Bar	5½ @	—
Sheet	7½@	—
Pipe	7 @	—
Shot, discount 10% on 500 bags Drop, ₰ bag	1 80 @	—
Buck, ₰ bag	2 00 @	—
Patent, do	2 50 @	—
QUICKSILVER—By the flask	56 00 @	56 50
Flasks, new	— @	—
Flasks, old	41 @	55
TINPLATE—B. V., steel grade, 14x20, to arrive	— @	—
B. V., steel grade, 14x20, spot	4 80 @	—
Obarcoal, 14x20	6 75 @	7 00
do roofing, 14x20	6 00 @	—
do, do, 20x28	12 00 @	—
Pig tin, spot, ₰ lb., nominal	23½@	24½
CHROME IRON ORE, ₰ ton	10 @	—
IRON—Bar, base	3 @	3½
Norway, base	4½@	5½
STEEL—English, lb	15 @	20
Canton tool	9 @	9
Black Diamond tool	9 @	9
Pick and Hammer	8 @	10
Machinery	4 @	6
Toe Calk	4½@	—

IRON—Glengarnock ton	Spot. 34 00 @—	To Load. 30 @ —
Eglinton, ton	34 00 @—	30 @ —
American Soft, No. 1, ton	—@32 00	33 @ —
Oregon Pig, ton	—@33 00	— @ —
Puget Sound	34 00 @—	— @ —
Bar Iron (base price) ₰ lb	— @—	— @ —
Clay Lane White	— @28 00	25 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Langloan	34 00 @—	30 @ —
Thornecliffe	34 00 @—	30 @ —
Gartsherrie	34 00 @—	30 @ —
Barrow	34 00 @—	30 @ —
Thomas	33 00 @—	— @ —
Cargobeet	30 00 @—	26 @ —

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 19) levied on the 26th day of August, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Buffington, J M, Trustee	496	500	$ 30 00
Berrows, Albert	955	600	96 00
" "	357	271	16 26
" "	426	700	42 00
Bogart, O H, Trustee	479	214	12 84
" " "	488	105	6 30
Bowers, D	979	20	1 20
" "	404	600	90 00
Francis, H L, Trustee	286	300	18 00
" " "	444	1,600	9 00
Nash, H W	269	104	6 24
Rosekrans, H M	30	600	36 00
Stout, Mrs M E	170	600	30 00
" "	188	600	30 00
Stout, C S, Trustee	476	2,000	120 00
" " "	477	953	67 18
Scerles, W A, Trustee	518	1,000	60 00
Stetson, A M, Trustee	520	5,000	300 00
Taylor, J N, Trustee	692	1,040	62 40

And in accordance with law, and an order of the Board of Directors, made on the 25th day of August, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on MONDAY, the 20th day of October, 1890, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California street, San Francisco, California.

DEWEY & CO
PATENT SOLICITORS.
220 MARKET. ST. S.F.
ELEVATOR 12 FRONT. ST. S.F.

HORACE D. RANLETT,
Ores, Mining, and Commission,
420 Montgomery St., S. F.

Ships under advances on smelting works in Boston New York, Beltimore and Liverpool.
Twenty-one years' experience in Shipping Ores and Managing Mines.
Solicits Consignments of Copper Produce and Management of Mining Matters.
All business conducted on Cash Basis.
Purchase and shipment of Mining Supplies A SPECIALTY.
Sales of Developed Copper Mines undertaken.
Business Manager of UNION COPPER MINE, Copperopolis, Cal.; NEWTON COPPER MINE, Amador Co., Cal.

"A RIGID EARTH," being devoted to Geology as Applied to Mining. By STEPHEN BARTON. In this work the author addresses himself to intelligent Miners who have, to some extent at least, familiarized themselves with the accepted theories of elementary geology. He has grouped together numerous observed facts tending to disprove the igneous theory, and to establish the proposition that below the action and influence of the atmosphere all fissures grow narrower with depth—that metal-bearing veins are produced by causes acting near the surface; and that the realm of successful mining never penetrates the earth one mile. PRICE $2.00. J. O. WARD, General Agent, 64 Main Street, Visalia.

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, September 30, 1890. At a meeting of the Board of Directors of the abovenamed Company, held this day, a Dividend (No. 96) of One Doller ($1.00) per share was declared, peyable FRIDAY, October 10, 1890, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer Books close October 6, 1890, at 3 o'clock P. M.

F. B. PRITCHARD, Secretary pro tem.

COMPLETE STEAM PUMP
10 SIZES FROM $70 TO $75
FOR WATER SUPPLY TANKS, FIRE PUMPS & ETC.
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And 170½ Second St., Portland, Or.
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E. P. HEALD, President.
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Having the largest permanent brick assay furnaces, chemical laboratory and mining office on the Northwest Coast, with a collection of about 4000 samples of the ores of Alaska, British Columbia, Oregon and the Northwest Territories; and having made personal examinations of nearly every mining camp on the Pacific Slope, from California to Alaska, I am prepared to do any class of legitimate and honest mining work, such as EXAMINING, ENGINEERING, SAMPLING AND REPORTING ON THE VALUE OF ALL MINERAL, COAL AND FIRE-CLAY PROPERTIES, BUILDING STONES, EARTHS, ASSAYS AND ANALYSIS OF ORES, WATERS, CHECK, SAMPLES OF ORE, PULPS, "ORGANIC ANALYSIS" WORK, and in fact any work connected with the office of a first-class mining geologist and chemist. Any information mining men may desire to know relative to the MINERAL OR COAL RESOURCES of the entire Pacific Northwest will be honestly given. Address Dr. Willis E. Everette, Consulting Mining Geologist and Chemist, 1318 E Street, Tacoma, Wash.

THE TWENTY-FIFTH
INDUSTRIAL EXPOSITION
OF THE
MECHANICS' INSTITUTE, 1890,
Opens Sept. 18th, Closes Oct. 25th,
With a grand display of Inventions, Manufactures and Art. The Latest Novelties and Improvements in Electricity will be made a special feature, including the celebrated Edison "Tower of Light." The Music will consist of a band of 42 talented musicians, supplemented by the best Vocal Talent obtainable. Miss Methilde Lennon, a noted Contralto Singer from London, and late from Boston, has been engaged, as also Miss Pearl Noble, the accomplished young Californian Cornetist. The Art Gallery, 300 feet long and 60 feet wide, will be filled with rare and beautiful works by local and foreign artists, in oil and water colors. Photography will be shown in the most attractive form by Professionels and Amateurs. Machinery of all kinds will be in operation, and many novelties exhibited for the first time.
Admission:
Double Season Tickets, $5.00 | Single Adult Admission, 50c
Single Season Tickets, 2.00 | Children, 25c
Season Tickets to Members of the Institute, Half-Rates.
J. H CULVER, Supt. DAVID KERR, Pres.

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Contractors for Prospecting
With Diamond Core Drill for Mineral, Oil, or Water, or for Boring Holes for Drainage, Etc.
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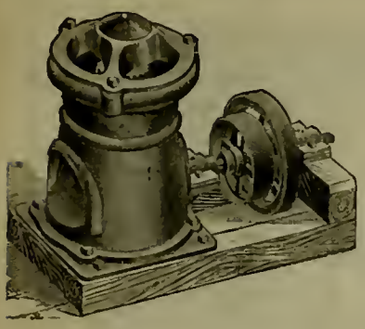

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The Gates Crusher having come eo largely into uee in all the Pacific Coaet Statee, ae well ae in other mining regione, ample opportunity has been afforded for compariaon, with the reeult that it hae an admitted euperiority for all euch eervice. Wherever ueed in connection with the reduction of oree, the advantagee have been eo apparent, and the reeulte eo extraordinary, ae to juetify the belief that it will eoon become a neceesary part of every mill equipment, even to the discarding of all other etylee of cruehere now in uee.

The moet important feature of thie Crueher is ite capacity for fine work, it being pose ble with any size machine to bring the product down to cubee that will paee a ⅜" or ½" ring. By this meane, the output of a mill ie increased from 25 to 30% without additional coet.

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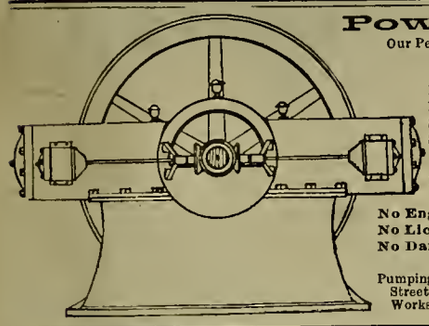

No Boiler, Fire, Smoke, Steam, Ashes, or Heat.

No Engineer, No License, No Danger.

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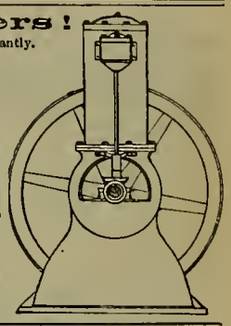
½ H. P. to 100 H. P.



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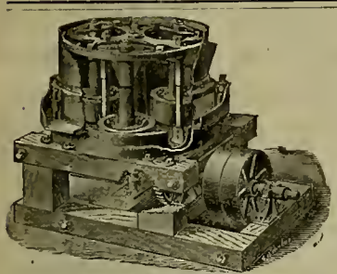

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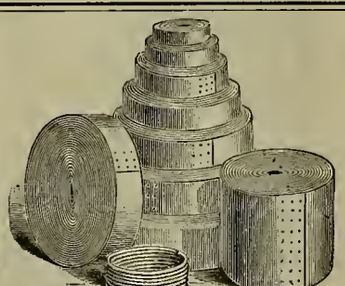

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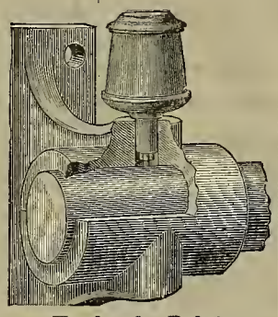

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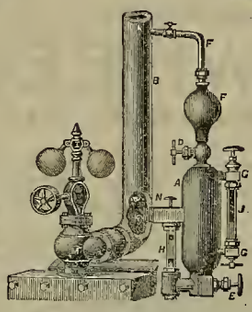

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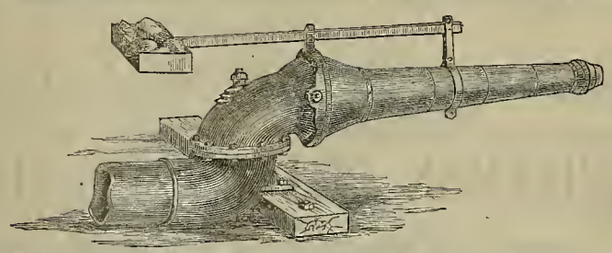

THE ABOVE CUT ILLUSTRATES THE IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture. We guarantee purchasers of this form of Giants against all costs, expenses or damages which may arise from any adverse suits or actions at law. We are further prepared to furnish **Single-Jointed Giants** when required. Prices, discounts and Catalogues of our specialties of **Hydraulic Mining Machinery** sent on application.

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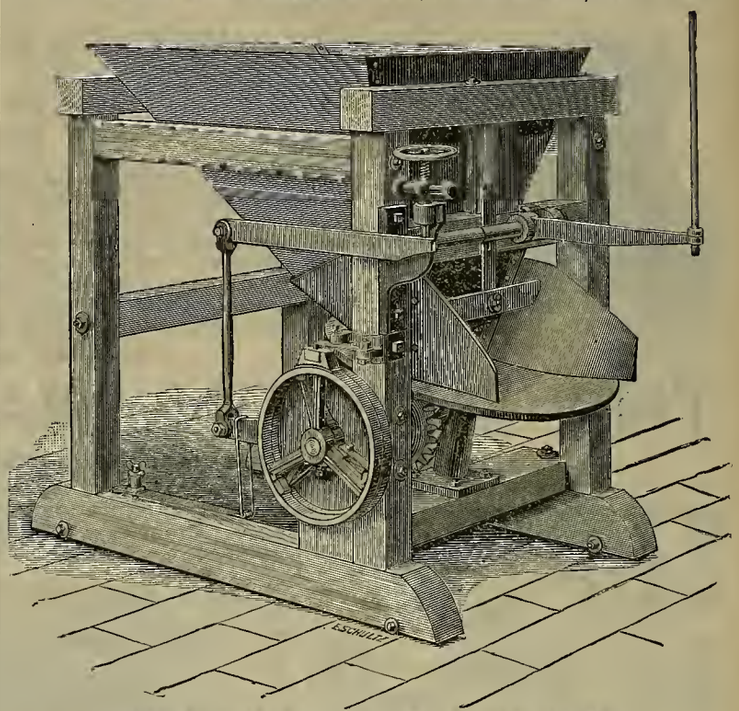

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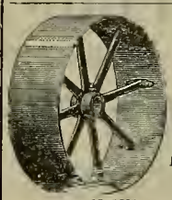

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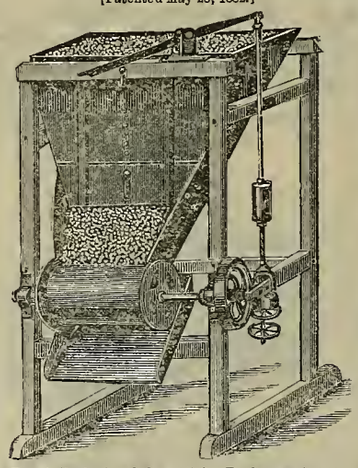

THIS is the best and cheapest Ore Feeder now in use. It has fewer parts, requires less power, is simpler in adjustment than any other. Feeds coarse ore or soft clay alike uniformly, under one or all the stamps in a battery as required.

In the Bunker Hill Mill it has run continuously for two years, never having been out of order or costing a dollar for repairs.

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Sole Manufacturers,
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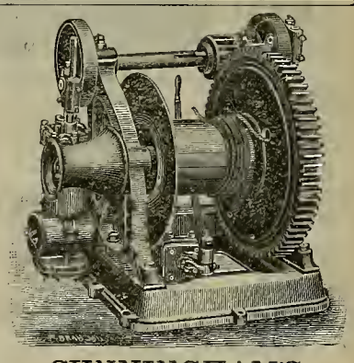
COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2 50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.



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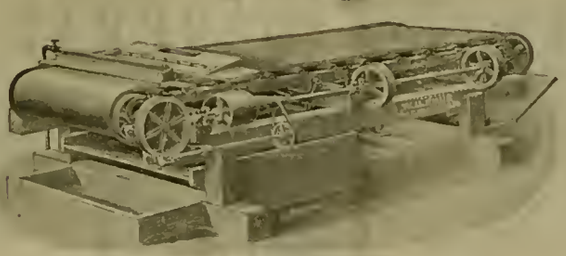
IMPROVED BELT FRUE ORE CONCENTRATOR.

The Best Ore Concentrator in the market, having do hle the Capacity and doing its work as olose as the plain Belt machins, while Its concentrations are olean. It is nsed in a number of Mills, the most notahle of which is the Alaska M. & M. Co's Mill, where 24 Improved Belt Frues are taking the Pulp from 120 Stamps, crushing 350 tons per day, and is giving ontire satisfaction as against 48 plain Belt Machines, taking the Pulp from the other 120 Stamps.



Price of Improved Belt Frue Vanner, $825, f. o. b.
Price of Plain Belt Frue Vanner, $575, f. o. b.

For Pamphlets, Testimonials and furthor information apply at office.

Protected hy Patents Decemher 22, 1874; September 2, 1879; April 27, 1880; Maroh 22, 1881; February 20, 1883; Septemher 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

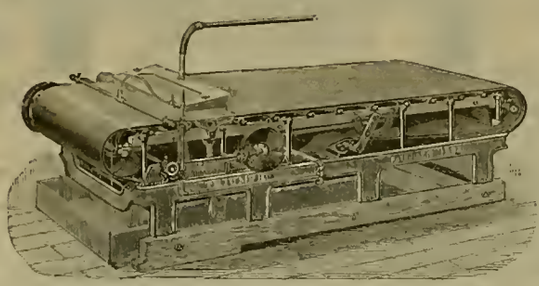
ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frne" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue' Vauner is the best ore oonoentrator In the market. The fact that the "Frnes" have improved (oorrngated) helts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

We are prepared to guarantoe tho superiority of the "Triumph" over the "Frne" or any other form of Concentrator, for coin if need be.
Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Trinmph" Concentrator and "Blasdel" (rifled) Belt are protected hy inoontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

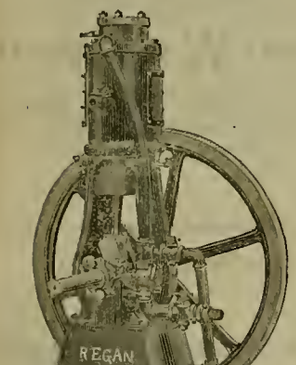
Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

REGAN VAPOR ENGINE.



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The Moment Engine Ceases to Run, all Expense Stops.
NO DANGER.
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Three-fourths to Fifteen Horsepower.
From $175 to $1200.
Send for Our Large Illustrated Catalogue.

GEORGE HAAS, 824 Market St., Phelan Building,
SAN FRANCISCO, Feb. 21, 1890.

REGAN VAPOR ENGINE CO.—Gentlemen: The 2 H. P. Engine you put up in our factory last November, has given satisfaction beyond my expectations. It do s my work better than than those two Electric Motors did, with scarcely any expense for gas. I paid the Motor Company $25 per month for power, while the Vapor Engine has cost me but $2 per month so far. But, be it understood, I have not used the Engine as much as in summer, but the cost of motor would have been all the same, making a saving of $68 in three months. I am satisfied the Engine will pay for itself in less than two years. I use it for freezing cream, run three fans, cocoanut grater, etc.
Yours truly, GEO. HAAS.

Regan Vapor Launches

The uses for small steamboats and launches are innumerable; they are convenient and serviceable for transportation and are a source of pleasure for those who are fond of sailing. But many have been deterred from purchasing such boats, because of the trouble and inconvenience of using coal, and the necessity of obtaining a Government license, engineer, etc. Our motor does away with these objections. The small space taken up by our engine in the boat **gives more room**; the boat will seat **twice** as many persons as one the same size fitted up with a steam engine. It takes only **two minutes to get under headway**, and can be stopped when running at full speed within the length of the boat, the reverse motion being instantaneous and effective. We carry in stock six regular sizes of hulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos. Kane & Co, Racine, Wis.

REGAN VAPOR ENGINE CO., 221-223 First St., San Francisco, Cal.

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ICE & REFRIGERATING MACHINERY

—FOR—

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HOTEL RAFAEL, San Rafael.

The "Vulcan" Ice and Refrigerating Plant is satisfactory in every respect, * * * * a model of good workmanship. The Ice is clear.

CHAPMAN AMMONIA VALVES.
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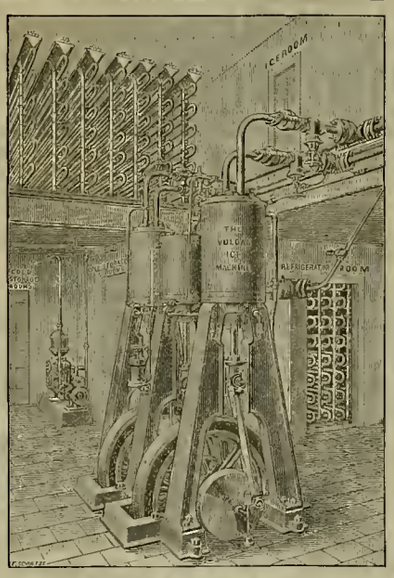
VULCAN IRON WORKS, 135-145 FREMONT ST., SAN FRANCISCO



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FINE WORKMANSHIP GUARANTEED.

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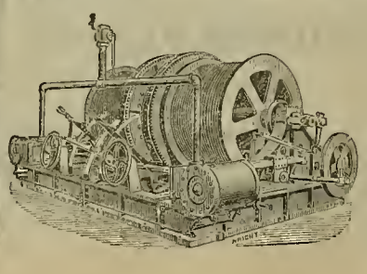

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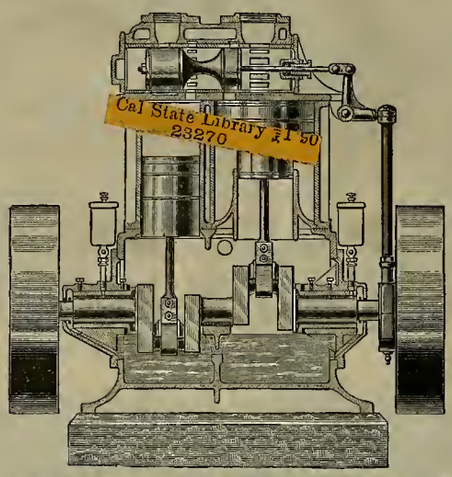
GREATEST CAPACITY OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps.



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SALES DURING LAST FOUR MONTHS:

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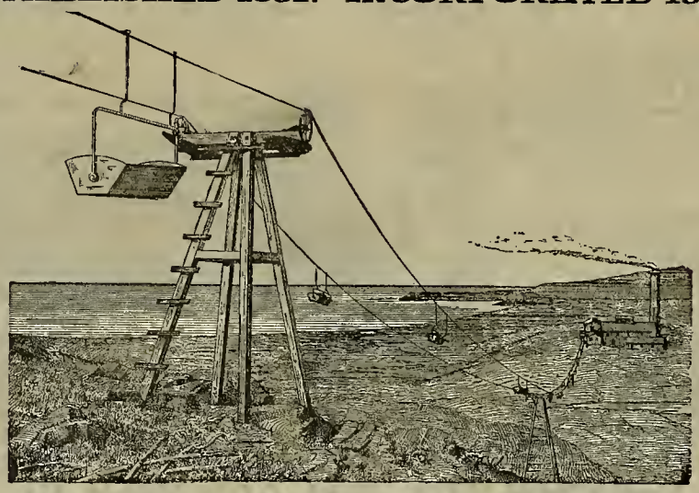

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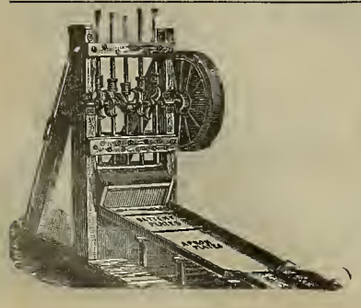

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 15. DEWEY & CO., PUBLISHERS.

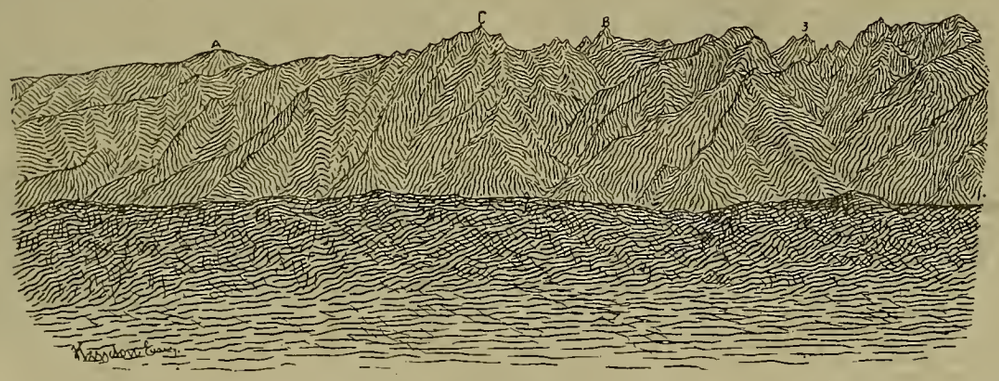
SAN FRANCISCO, SATURDAY, OCTOBER 11, 1890.

Three Dollars per Annum. Single Copies, 10 Cts.

Views in the "High Sierra."

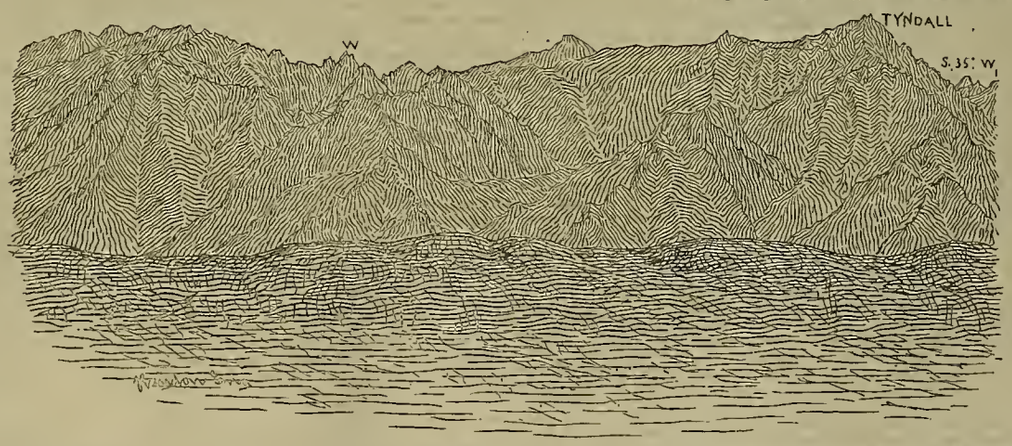
The four cuts presented on this page represent a section of the Sierra Nevada mountains as seen from the opposite side of Owens valley, which skirts these mountains on the east. This section, beginning near Walker's Pass on the south, extends thence north along the range for a distance of about 60 miles, covering Mts. Whitney, Williamson and other lofty peaks standing along this portion of the Sierra.

Commencing on the left at an altitude of about 5000 feet, the crest of these mountains gradually ascends until the summit of Mt. Whitney, the culminating point, is reached,



there being several other peaks in the vicinity nearly as high. The altitude of Mt. Whitney, as determined by W. A. Goodyear, assistant of the State Mining Bureau, in the field, is 14,898.5 feet, which measurement was essentially confirmed by observations made by Clarence King, U. S. Geological Survey, which fixed the altitude of this mountain at 14,887 feet above the level of the sea. To Prof. Goodyear we are indebted not only for the above figures, but also for much of the data employed in these notes, the same having been derived from his very able article on the "Geology of Inyo County," published in the 8th Annual Review of the State Mineralogist, to whom also we are indebted for the use of the cuts here presented.

Near the center of the engraving the location of Mt. Whitney is denoted by the letter *W* placed over it. As shown here, it does not appear to be the highest point in the Sierra, this being due to its position far back in the range.



LONGITUDINAL SECTION OF THE SIERRA NEVADA.

Sheep mountain, the eminence seen on the left, as also several peaks on the right, all standing in the foreground, have the appearance of being higher than Mt. Whitney, some of them being, in fact, nearly as high. Neither Sheep mountain nor Mt. Williamson, the last-named being the elevation standing in line with and next on the right of Mt. Whitney, is more than a few hundred feet lower than the latter.

To see what constitutes the "High Sierra" to advantage it should be viewed from the summit of the Coso mountains, lying over to the east and some 20 miles away. From that vantage ground the awful precipices, crags, pinnacles and canyons of this truly Alpine region are brought into full view, the prospect from the valley being dwarfed and obscured by the interposing high ridges standing in the foreground. Nothing can exceed the grandeur of this billowy sea of mountains looked at from these high lands to the east.

The low dark-colored ridge extending along the base of the main Sierra, consists of debris washed down from the mountain above, and which, from a hight varying from 500 to 1000 feet, slopes gradually down to the plain of Owens valley.

The scanty soil on this ridge, which is composed mainly of bowlders, cobbles and coarse gravel, barely suffices to maintain a scattered growth of sagebrush, greasewood and the wild grasses, no timber growing here.

There are to follow several more of these cuts illustrating the topography of the Sierra some distance farther north. In presenting these in the columns of the PRESS, as it is our purpose to do next week, we will not only speak of the section to be added, but will describe ground already gone over, a little more in detail.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Mining Notes from Deadwood, Trinity County.

[From an Occasional Correspondent.]

EDITORS PRESS:—Through the courtesy of the foreman, Mr. Frank Hollingsworth, we were shown through the Brown Bear mine, located in Deadwood canyon, about half-way up the grade leading over Trinity mountain. This mine is said to pay the largest dividend in proportion to the expense of running it of any mine in the State. Fifteen stamps are kept constantly dropping on the Brown Bear ore, and there is every probability that the mine is good for many years to come. It is worked through a tunnel some 4000 feet in length, this tunnel supplying all the water needed in and about the mill, located about 50 feet below its mouth. The ore here on being brought out of the tunnel is dumped directly into the mill.

The original owners of this mine sold it to the present company, they supposing at the time that it was worked out, the miners employed by them being Chinamen. The new owners ran straight ahead on the ledge and did no crosscutting, having discovered that by following up the small seams encountered they led to pay chutes of various sizes. So much work has been done here that the mountain is a veritable honeycomb—stopes, drifts and tunnels running in every direction. One can pass through the main Brown Bear tunnel into the hoisting works of the McDonald mine, located some 3000 feet away. This mine, which has turned out some $800,000 or $900,000, is shut down for the present, only a small working force being now engaged doing prospecting work. The company is running a tunnel to come out on the Brown Bear side, and it is reported that they have found very rich ore.

The reduction works of the McDonald Co., which were crushed in last winter by the weight of the snow, have just been repaired, and they are now treating the sulphurets from the Brown Bear mine.

Mr. Joseph Failing is putting up a cannonball mill to work the ore of his mine, which looks very well.

Mr. A. D. McDonald has leased the Frick & Davis mine, which has turned out very rich ore in the past. He expects to make a new strike in that ground.

Deadwood, Trinity Co., Oct. 1, 1890.

Chicago Polytechnic Institute.

The Chicago Polytechnic Institute was formally opened on the 8th day of September last, the three upper floors of the building at the southeast corner of Madison street and Fifth avenue having been fitted up for this purpose. The plan of the Polytechnic, as the name implies, is to comprise in one great system all the departments of technical and industrial education, with a special reference to whatever will fit young men or women for the practical duties of life, and enable them to earn a living by skilled labor. In the trade school will be taught bricklaying, plastering, plumbing, carpentry, house and sign painting, stone-cutting, machinists' work, tailoring, watch making, wood-working, architecture, etc. Special lessons will also be given in all English branches and high-school studies, languages, bookkeeping, shorthand and typewriting. All trades are supervised by a committee of the masters' associations of the city, including the Traders' and Builders' Exchange.

The instruction will be scientific as well as technical. The Slojd work is free, but nominal tuition is charged in the other departments. This school is modeled after the Polytechnic and People's Palace of London, and is philanthropic in its character, but believes that our youth should not be educated to get something for nothing, and that independence of character should be cultivated by giving its students more or less financial responsibility and interest. The members will form a society, meeting monthly, and will publish a magazine called the *Polytechnic*. A lyceum, a mutual benefit association and choral union will also be organized among the members.

The Slojd school, on handicraft in wood, is under the charge of experienced teachers, and is intended as a connecting link in manual training between the kindergarten and industrial school.

SILVER ORE IN BRITISH COLUMBIA.—Old-time prospectors are fond of displaying "pocket pieces" of ruby silver from the mines of Nevada, horn silver from those of New Mexico, pure slugs from the early worked mines at Silver City, Idaho, and wire silver from the pockety districts of Arizona. These same old-timers will solemnly affirm that there is nothing in British Columbia but low-grade, rebellious, refractory, pot-metally conglomerates, and that nothing but disappointment is in store for the men who have faith in that country. But notwithstanding these gloomy predictions, something turns up daily to prove the old-time prospector a bad guesser. Recently, says the *Miner*, a strike was made in the United ground, in Hot Springs district, that caused quite a commotion in that lively camp. At a depth of 22 feet an 18-inch chute of high-grade ore was uncovered, which gives assays of over $13,000 to the ton. The native silver is in the form of wire, and some fine specimens have already been taken out. The United is an 8 foot ledge of solid galena, the owners having 800 tons of ore on the dump as the result of four weeks' work.

Labor and Capital "Rings."

Here is what the *Australian Mining Standard* has to say on the above subject:

This is an age of combinations. The effort and intelligence of the individual are as important as ever they were, and indeed are more important, as they gain in power by association with the efforts and intelligences of others. Never has it been more widely recognized that "union is strength." Labor which, up to within quite recent years, was altogether without federation, is handing together. Capital, which has always recognized some common interest, is also awakening to the necessity of closer union in order to meet the onward march of federated labor; but the spirit of combination has spread far beyond this, and has manifested itself in "rings," "corners," or "trusts." These are associations differently named, but all having the one object of sustaining or raising the market-price of some article, the operators when successful seouring from the consuming public the difference between the normal and the inflated value of the article operated upon. This is their payment, and sometimes it is a princely one. Sometimes in some countries imprisonment, fine and bankruptcy are the payment; but in other countries these results are not to be anticipated, and the prizes are sufficiently large to promote the frequent creation of "corners."

The laws of different countries, in respect of these combinations, vary greatly. In England, under certain circumstances, those who engage in these operations are liable to criminal prosecution for conspiracy; but the law and its application have been considerably modified and relaxed, and, strange as it may appear at first sight, it is certain that labor has been principally responsible for this extension of privilege to capital. Of course, labor has benefited at the same time. Not many years ago in these colonies, and we believe in Tasmania to this day, it is a punishable offense to be a member of a trades-union, which is nothing more nor less than a labor "ring." It is the democratic cry to-day—by the way, what or who is a democrat?—that "rings" and "corners" and such combinations should be expressly made illegal. But, on principle, why? Trades-unionism, we say, is an excellent thing. Even capital does not ask that it should be declared illegal. Ninety-nine out of every hundred people probably hold this view. What is puzzling, then, is why there should be so great an outcry against "corners" and "trusts." These are but capital's "rings," as trades-unions are labor's "rings." Labor is the laborer's capital; and when the laborers combine in unions they do it in order to sustain or advance the selling price of their capital. This is identically what capitalistic "rings," "trusts," and "corners" are formed for. And yet so many people are inconsistent enough to ask that capital should not be permitted to form "rings" while labor may. There is something wrong.

The inducement for these observations is the announcement that a bill has passed the Legislature of the United States declaring "trusts" and "corners" illegal, and that it has been sent up to the President for his approval. The bill is an immensely popular one in America, we are told—popular, we have no doubt, among trades unionists and their supporters. Is this fair? Does it display a calm, judicial mind? Laborers have our warm support, as the trades unions also have. But there is such a thing as forgetting that the other side has equal rights. It is a catchword among agitators that all legislation tends to the strengthening of capital's position. This has been repeated so many scores of times that otherwise really sensible people seem to believe it now. France has a law against capital's "rings;" it has none against labor's. No English trades unionist can be successfully criminally prosecuted for being a member of his union or for "striking," provided, of course, he has not made an agreement for service; but the English capitalist takes the risk when he forms a "ring" of being prosecuted for conspiracy. And from America comes the latest example, the Legislature having expressly declared capital's "rings" illegal while passing by labor's "rings" formed for identically the same purposes.

NEW YORK is now favored with a Fire Predicting Bureau, not altogether unlike that of the Weather Bureau, and the insurance companies making use of the agency are said to find that the amount of their subscriptions is a paying investment. On Broadway alone it is said that 15 fires occurred among the several hundred numbers in the hooks between Jan. 4, 1887, and April 26, 1890. The Prediction Bureau, it is added, adjusts the losses.

ALUMINUM FOR CALKING.—Aluminum wire is being used for calking pipes in New York. A wire of one-fourth inch is used, one turn of aluminum wire being first inserted, followed by four or five turns of a lead wire of slightly larger diameter, these last being calked in the usual manner. It is found that the aluminum does not cut, and it is not acted upon by the steam as the lead is, so that the joints, it is claimed, remain tight.

Is There Such a Thing as Luck?

Arthur McEwen tells the following in the Virginia *Chronicle* on "Uncle" George Hearst, the mining man:

All very rich men who have made their own fortunes are believers in luck, as they have reason to be. George Hearst, who thinks of a million as ordinary men do of a dollar or two, owned to me once that he regarded his possession of a great fortune as a sort of a miracle. "I was 49 years old," he said, "when the row made over the discovery of the Comstock silver mines in Nevada set the whole coast wild. I had been disappointed in the work I had been at, and found myself pretty nearly broke. I had enough to buy a horse and the outfit, and started over the mountains with a party of the boys. That broke me, and I wasn't feeling happy, because I'd worked and struggled and speculated for a good many years, and it struck me as rather rough that a man of my age should have to start out, as I did then, like a young fellow. There were about 10 or 12 of us in the party, and as I was blue they let me rather alone, and my mustang being rather worn down, I stopped on the trail, put my arm through the bridle, and picked out a rock to sit on. The rest of the boys rode on, but I sat there. There wasn't any reason why I should particularly, only I did. The whip I had was a willow switch I'd pulled from a tree as I rode along. As I sat there I switched the dust of the trail, and thought, 'Shall I go with them, or shall I go back?' I switched and switched, and thought and thought. I saw behind me all the hard work I'd done, all the chances I'd taken and lost on, and felt old, and need up, and no good. My sense told me to turn back and make my fight where I was known. There was safety in that, anyhow. But I'd been camping night after night with the boys ahead of me, and it made me lonesome to think of parting company with them. So after switching and switching the dust on the trail, and feeling weak and human because I yielded, I mounted my horse again and rode on after the party. I got to the Comstock and in six months I made half a million dollars. That was the foundation of what I've done since. Now, why shouldn't I have turned back when I hesitated? It would have been sensible, 'conservative' to do that, but I didn't, and because I didn't I won. If you're ever inclined to think there's no such thing as luck, just think of me."

WORTHY OF HIS HIRE WHEN HE MAKES HIMSELF WORTHY.—Western molders seem inclined to foment trouble with their employers. Indications of this are cropping out in a number of directions. Stove manufacturers have observed for some months past that even their best workmen were not turning out as much work as they could easily do and much less than might be reasonably expected of them. Trifling matters have been magnified into grievances, and men have transferred themselves to other shops on the slightest pretext, only to return again and conduct themselves still less satisfactorily than before. A strike in a large machinery establishment in Chicago last week developed the same condition of affairs in that line. The foreman of the works states, in a published interview, that the molders had latterly not been doing the amount of work that should be done in a day, and he had been obliged to discharge some of them on that account, whereupon the others struck. The uniform tenor of reports from foundrymen indicates concerted action on the part of the molders in various localities to cut down work. This is probably in sympathy with the movement among workingmen to reduce the working day to eight hours. It is to be hoped that the broad view of the situation thus set forth is not fully justified, as there never was a time when workingmen were so fully employed at good wages as is the case at present in the West. The relations between employers and employed should be of the best nature. No one is oppressed or asked to work at starvation rates, but he is expected to render a full equivalent for the wages he receives. "The laborer is worthy of his hire" when he makes himself worthy.—*N. Y. Iron Age.*

THE RIVER AND HARBOR BILL was signed by the President on Sept. 19th, and is now a law. Doubtless the most important provision of the bill is that appropriating $6 200,000 for securing a deep-water harbor at Galveston, Tex., a measure for whose success the South west has been working most energetically. It will be remembered that this site for a deep-water port on the gulf was recommended by a board appointed from the U. S. Engineer corps some months ago. Other Southern harbors receive generous appropriations, among them Savannah and Charleston. At the former port work is to be commenced on improvements which are intended to secure a safe channel with 26 feet of water from Savannah to the sea, at a total cost estimated at $6,000,000. The expenditure of the many million dollars appropriated by the bill will certainly have a very marked effect in giving employment to engineers and contractors, especially the latter.

THE PIKE'S PEAK RAILWAY (Abt system) is progressing rapidly to completion, in spite of some annoying delays. The first trial trip with a passenger car was made Aug. 14th; on the next day the road was opened to the public as far as the Half Way House, with two trains daily; but these were stopped Sept. 1st for lack of sufficient patronage and because it impeded somewhat the work at the front. The cars are nearly all glass from window sill to roof, with very narrow pilasters between windows. The track is now well above the timber line, within about 1000 feet of the summit.

Beatty's Improved Steam Motor for Pumps.

Judge H. O. Beatty of Sacramento had on exhibition at the State Fair his new steam motor for pumps recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency. This ingenious machine takes the place of an ordinary steam engine in pumping water with any kind of lift or suction pump. The steam is taken directly from the boiler or steam drum to the steam-chest of the motor, and from that chest rises directly under the piston in an upright cylinder. The piston-rod is connected with the pump-plunger, and as the piston rises in the steam cylinder the pump-plunger follows and discharges its load of water. When the piston reaches the proper hight in the cylinder, the valves in the steam-chest are reversed, the steam is shut off and that in the cylinder is set free. As the steam escapes from the cylinder the plunger returns to its original position by its own weight. As the piston reaches the bottom of the cylinder the valves are again reversed and another upward stroke is made.

This method of using steam only half the time (during the upward stroke) and wasting no power in converting direct motion into crank and circular motion and none in forcing water at high speed through crooks and elbows in small pipes, saves a great amount of steam-power that is wasted in the old-fashioned pumps.

In most of the direct-acting pumps, the steam cylinder is as large, sometimes twice or three times as large, as the water cylinder. The piston in the steam cylinder and the plunger in the water cylinder both having the same motion, it of necessity takes one foot or sometimes two or three feet of steam to raise one foot of water. But with this motor, according to the inventor, when the water is not raised over 20 feet in hight, the water cylinder is about seven times as large as the steam cylinder, so that a foot of steam raises from 7 to 20 times as much water as those pumps. Of course when the steam cylinders are two or three times as large as the water cylinder, then these pumps will raise the water much higher than 20 feet.

This motor is well adapted to running quartz stamps in portable quartz-mills. A small quartz mill can be manufactured with stamps of any desired weight, in which no one piece of the whole need weigh over 200 or 250 pounds. After this machine is set up and ready to run, no skilled labor is required. A motor and pump are set up at the Union Foundry of Root, Neilson & Co., Sacramento, and will be set running for the inspection of any one interested. A motor will also be exhibited at the Mechanics' Fair in this city.

SULPHURETS TREATED BY A NEW FREE-MILLING PROCESS.—That there will be little difficulty in treating the sulphuret ores of the gold district lying between Eagle and Rover creeks, west of Nelson, by the McArthur-Forest process, is almost beyond dispute. The process has been tried at Denver, Colorado, on ores from Chihuahua, Mexico, with the result of saving 90 per cent gold and 60 per cent silver. On low-grade refractory ores taken from Boulder, Gilpin, Rio Grande, Conejos and other Colorado counties, the result was even better than from the Mexican ore. In South Africa 1½ tons of concentrates from the Randt, containing 80 per cent of pyrites, were treated as a test, giving a result as follows: Gold in concentrates before treatment, 24 ounces 10 pennyweights; gold in residue after treatment, traces; extraction over 99 per cent. This method of treating concentrates has the advantage of great simplicity and economy, combined with the highest efficacy in practice and results. In Scotland, where the McArthur-Forest Company has its main plant, ores from Chili are treated, and enough money is made to create a value of $16 50 for stock worth $5 at par.

ALL of the window-glass manufacturers of the United States, those of New Jersey alone excepted, will be known hereafter as the American Glass Co., with principal office in Pittsburg. The property of the different firms does not pass into the possession of the combination, but is controlled by it nevertheless. Each factory, large or small, will pay $5000 in cash or in goods into the common treasury and will send one delegate. The delegates elect a board of directors, who will practically run the entire window-glass business of the country. They will do all the selling to the agents or jobbers, no factory being permitted to sell individually through any other agency.

THE Seattle, Washington, *Press* says that the immense lumber production of the Puget Sound mills exceeds that of any other section in the United States. During the year ended May 31st the quantity of lumber manufactured on Puget sound was 303 986,692 feet. Of this quantity 233,481,057 feet were shipped to foreign and coastwise markets. To foreign ports 163 vessels carried 172,502 205 feet of lumber valued at $1,438,847. In the coastwise ports were marketed 160,978,852 feet of lumber, which was transported in 262 vessels.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XIV.

[Written for the Press by James H. Crossman.]

The Black Hawk Mining District.

This district is situated in a spur of the San Bernardino range of mountains of the same name on the district. Its trend is easterly and westerly, and it contains on its northerly flank an important belt of limestone, to which reference has been made in article three of this series. This belt cuts on important figure in the mineral resources of San Bernardino county. Adjoining its incasing rocks on either border, the limestone is dolomitic in character, containing on its southerly contact with a metamorphic granitic rock, veins of quartz and spar carrying the ores of lead, silver and copper, while on its northerly border gold and silver predominate.

This belt of lime is from four to six miles in width, extending and traceable at intervals from Bear valley to a point near the Colorado river. It contains in its make-up nearly all the varieties of limestone known to exist: Blue limestone suitable for manufacturing the lime of commerce, a carbonate of lime, pure crystalline and white, for structural or sculptural purposes; magnesian limestone, dolomite, known by the Latin races as the "metallic oriador." Its boundaries on the south are a granitic rock, and on the north a micaceous schist, underlaid by syenite and gneiss, but on both borders of the contact dolomitic rocks occur.

On the northerly border of this belt we find the series of mines known as the Black Hawk group, consisting of 21 locations, the most of which comprise an area of 1500 by 600 feet on the main mineral belt that here traverses the country.

The summit of Black Hawk mountain is 6720 feet above sea level. The bottom of the ore deposit on the Hecla is 5830 feet above sea level, and the top 5855 feet. The bottom of Tunnel No. 2 on the Lookout is 5250 feet, and of Tunnel No. 1, 5275 feet above sea level. The entrance to Black Hawk ravine from the desert is at an elevation of 4100 feet.

These mines are situated on the northerly flank of the range as it slopes toward the desert. The apex of the mountains at a point opposite the group in a southerly direction is 6700 feet high. Descending the mountain, we reach the Santa Fe and Lady Alice at an elevation of 6050 feet; at a lower elevation, and lying parallel, the Calumet and Hecla occur at 5855 feet. These four locations course with the stratification and dip into the mountain southerly at an angle of 35 degrees. They are well set in their incasing walls, showing no evidence of disturbance or displacement.

The remaining 17 have a reverse strike and lay conformably on a hard slenitic floor, dip southwesterly at a small angle of inclination as well as easterly and westerly from the ridge's center, varying in thickness from 10 to 60 feet. Strictly speaking, they form a blanket of gold-bearing quartz covered by from 10 to 40 feet of soil and debris. The quartz, to all appearance, has in places been by some powerful dynamic force pulverized, broken, disintegrated and crushed into a condition to be fed to the mill-hopper after passing over a grizzly to remove the coarser pieces. It contains bright particles of gold often visible to the eye, and is accompanied by some base which is not easily amalgamated. The ore here can be mined and milled at a very low figure. This deposit has been developed in a number of places by a system of open cuts in a quarry form, several tunnels having also been driven at right angles with the strike into the mass.

A Big Slide.

The observer would at first be puzzled to account for the origin of this singular formation, a blanket deposit gently sloping from the mountain toward a lower level. (This position of the vein would be reversed if it were in place undisturbed.) This mystery is solved if we ascend the precipitous mountain slope and examine the footwall of the Hecla and Calumet veins, which consists of a soft and easily decomposed variety of a calcareous schist, containing sufficient magnesia and talc when wet to slide and break away with the weight of the superincumbent mass. In point of fact it is a slide or slip of the face of the mountain on a mammoth scale. The movement was so slow that nothing has been displaced in the change of the lode from its former semi-vertical to its now nearly horizontal position. An estimate of the number of tons involved in this displacement would take a formidable array of figures. The quartz in the deposits has been estimated by good judges to carry gold values of from $2 to $25 per ton of 2000 pounds. Several drifts have been extended into the ore body for a distance of 180 feet, the face of which shows 20 feet of ore.

The outlook for the Black Hawk mines is particularly bright. A portion of this property (the Lookout and Buena Vista mines) has recently been sold to an English syndicate, who have since erected a 10-stamp mill upon them, the property being under the superintendence of Harry Del Mar. Wood for fuel and timber for mine purposes are abundant within a reasonable distance of the mines.

This company has brought in water through pipe from several springs in the vicinity, and is utilizing it for power as well as amalgamating purposes. It is claimed that there can be procured a sufficiency of water for a 100-stamp mill, the source of supply being at so great an elevation that any desired amount of pressure can be obtained.

Among the principal supplying springs, the Crystal is situated at an elevation of 6120 feet; the Arctic at 6450, and the Live Oak at 6700 feet above the level of the sea.

Reserves.

On the Santa Fe and Lady Alice, the most southerly mines of this group, the ore body has been exposed for a length of 800 feet by a width of 34 feet.

The Hecla, which joins the Santa Fe on the north, shows a large body of ore, some of it high grade.

Lady Alice and Calumet adjoining are but little worked. The Pinon claim shows a large body of ore, some of it being high grade.

The Lookout, adjoining the Pinon on the north, shows also a large body of ore (30 feet thick) 1000 feet long, much of it high grade. This mine has been opened by two tunnels 180 feet apart, and each 100 feet long; several open cuts having also been run, an upraise has been made through the ore to the surface.

The Senator mine joins the Lookout on the north, and shows a large body of ore opened by two short tunnels and open cut.

Black Hawk mine joins the Senator on the north, and shows a body of ore 600 feet long and from 10 to 60 feet thick, considerable of it high grade. It is opened by two tunnels 40 feet apart and several open cuts.

The Morongo King, Glasgow and Overly Scott.

Situated on the same vein and contiguous to each other, lie on the eastern slope of Black Hawk mountain, 18 miles easterly from the Cushinghury Ranche, at an elevation of 4500 feet above the level of the sea. The vein takes a curvilinear form, striking northwest to southwest. It lies between granite and a micaceous schist. On the Morongo King a shaft has been sunk to a depth of 180 feet, with lateral drifts of 30 feet. The ores are bunchy and spotted, but reported to carry gold values of $12 per ton. Eighty feet northerly from the first-mentioned vein, on the Overly Scott, a shaft of 14 feet deep has been put down. Antelope Springs, easterly ½ mile, would furnish enough water for mill purposes. There is wood for steam in the vicinity.

Preciado & Vader's Group of Mines

Are situated in Tp. 4 N., R. 6 E., 3 miles westerly from Old Woman's Springs. The locality is known as the Silver Reef. It lies in the same mineral belt and easterly from the Black Hawk group of mines. This district is but little known, nor are the lodes here much prospected, though quite numerous. Some of them show considerable strength, their ores carrying silver with traces of lead and copper. Several locations have been made by a Mexican company and a shaft has been sunk on the Hermosillo mine to a depth of 100 feet, from which there has been extracted about 100 tons of ore. This ore, graded to values of 84 ounces per ton, was hauled to Victor by wagons and thence sent by rail to San Francisco for reduction. Strike of vein, N. 40 E.; formation of incasing walls, lime (magnesia) and a porphyritic granite. But seven locations in all have been made here; the only developments of any account are on the Hermosillo and Santa Maria.

The Morongo Mining District

Lies on the southerly flank of the San Bernardino range of mountains. The formation here consists of metamorphic and porphyritic rock in which several large springs come to the surface. Scattered gold-bearing veins occur throughout the district, but are yet unimportant as producers, not having been developed to any extent.

The Rose Mine

Lies 14 miles southerly from Cushinghury, at an elevation of 7250 feet and near the head of Rattle Snake Canyon. The vein is heavily charged with iron in an oxidized form, and is said to carry gold values from $5 to $110 per ton. Its strike is north 20 west, and it is inclosed in walls of micaceous schist and talcose slate. It crops strongly for a distance of several thousand feet, and has been developed by a shaft to a depth of 100 feet. Two miles southeasterly from this mine there are a number of small veins from two to four inches thick, the ore from which has been worked by Mexicans in arastras, yielding over $100 per ton.

The Lawrence Mine,

A silver-lead bearing vein, situated in Rattle Snake Canyon, is four feet thick and developed by a 40-foot shaft and drift of same length. Its strike is north 40° east, dip southerly at an angle of 45°, vein inclosed in a formation of granite and micaceous slate.

The Morongo mine, 2000x600 feet, is situated in Pioni valley, 10 miles in a southeasterly direction from the Black Hawk mines, and six miles from Bear valley, in the Black Hawk mining district, and at an altitude of 6300 feet. The strike of the vein is N. 70 West, dip South 55 degrees. The footwall is composed of lime shale; hanging-wall, dolomite. The vein varies in strength from 10 to 40 feet and is reported to carry silver values of from $10 to $400 per ton. Capt. Peter Mackie, co owner with Messrs. Nichols & Childs of Los Angeles, reports that 300 tons of select ore were shipped to Colorado, Argo and Denver that returned $400 per ton, average value $45; the ore contains galena and silver, the latter in the form of a chloride with a small percentage of gold.

The mine has been developed by a series of shafts (nine in all) of varying depths, the deepest being 137 feet, where crosscuts show the vein between walls to be 40 feet thick.

The Yucupa mining district is situated 20 miles E. N. E. from Colton. In this district the Southern California Land and Stone Company have opened a promising quarry of sandstone and erected a mill on Mill creek. The stone here obtained consists of two varieties, the first and most valuable being a hard, fine-grained bluish rock, the second yellow and coarse, with less tensile strength. The rock splits and dresses well and can be quarried in blocks of any desired dimensions. This stone is known as the mentone and has acquired quite a reputation for structural and street-paving purposes. In the vicinity of this quarry a strong belt of limestone courses easterly and westerly, on which a quarry has been opened, kilns erected and commercial lime produced. The formation here, which has been highly metamorphosed, contains granite, porphyry and magnesian slates with metalliferous veins of quartz carrying the ores of both silver and gold. But little development work has, however, been done.

The Digleer

Granite quarry is situated on land owned by a colony of that name, 12 miles west of Colton and 4½ south of Cucamonga. Though this quarry has not recently been opened, we have good accounts as to the quality of the stone.

Clay.

A valuable body of clay exists in the vicinity of Colton, from which a first-quality of brick is burned.

(To be Continued.)

Diamonds in Australia.—It appears from a publication recently issued by the Government statisticians of New South Wales that many descriptions of gems and gem stones have been discovered in various parts of the Australasian colonies, but no systematic search has been made for any but the diamond. Diamonds are found in New South Wales, Victoria and Queensland, but only in the first named colony have any attempts been made to work the diamond drifts. The principal diamond-fields are situated at Bingera, near Inverell, in the New England district. The Government of New South Wales has on various occasions obtained the service of experts to report upon the fields, as well as the gems which have been from time to time extracted from them, and these reports, it is said, have generally been of an encouraging nature. The number of diamonds found in the colony to the end of 1887 is estimated at 75,000, the largest one being 5⅝ carats, or 16 2 grains. The diamonds occur in old terrestory river drifts, and in the more recent drifts derived from them. The deposits are extensive and have not yet been thoroughly prospected. The New South Wales diamonds are harder and much whiter than the South African diamonds, and are classified on a par with the best Brazilian gems. During the year 1887 the diamond companies at Cope's Creek, near Bingera, produced about 23,000 diamonds, weighing 5151 carats; but in 1888, owing to the severe drought which occurred, the search for diamonds had to be temporarily abandoned.—*Mining Review.*

New Mexico Onyx.—Mrs. L. J. Caldwell of Chicago is the owner of ricolite and green onyx quarries being operated in Western Grant county, New Mexico. This is one of the most remarkable discoveries. The stone has the form of true fissure vein 50 feet wide and over a mile in length, and it is taken out in massive blocks and taken to Chicago, where it is becoming very popular for house decoration inside and outside. The stone is susceptible of a very high polish, and of a variety of colors—dark green and cream, striped and mottled, also pink and salmon. In fact, it carries what are termed the "lost colors" in stone. It is very tough, is superior to Mexican onyx, and is the only stone of the kind in the world that can be carved. Contracts have been signed to furnish to the new Alhambra theater and hotel and other public buildings in Chicago for decorative purposes. Mrs. Caldwell offers blocks of it to be used in the construction of the New Mexico exhibit pavilion at the World's Fair.—*Stone.*

Tunneling under the New York Narrows.—The long-talked-of scheme of tunneling under the Narrows in New York harbor has, it is announced, been seriously taken up by well-known capitalists, and it is quite possible that in the course of a few years we shall see railroad lines connecting the Great West with the eastern end of Long Island and ocean ferries to Great Britain. It is considered that the most desirable line for running a tunnel is one from somewhere near Fort Wadsworth, on the Staten Island shore, to Bay Ridge. The scheme, as far as known, contemplates the construction of two parallel tunnels at a depth of 35 feet below the bottom of the bay. The length is roughly put at one and three-quarter miles, and the cost, it is estimated, would not exceed $5,000,000, as it is considered that there will be no particular difficulty attendant upon the work of construction.

The largest and highest electric-light tower in the world is to be erected in Minneapolis.

North Dakota Coal.

For the past five years the question of transmitting coal from the coal-beds of North Dakota down the Missouri river to Pierre has been under discussion, but owing to the general stagnation of business throughout the State since 1886, and the falling off of transportation on the river, the question for a time was lost sight of, but with the advent of the large river boat, the Ahner O'Neal, or the Chaska as it was at first called, the people were again awakened to the necessity of taking hold of this matter of supplying this portion of South Dakota with cheaper fuel. The matter was arranged, and Mr. A. L. Silver, a practical coal man, was sent to North Dakota to investigate, and he was so favorably impressed with the outlook that he immediately purchased several hundred acres of these coal lands north of Bismarck and is now organizing a company, with a capital of $30,000, to begin active operations. The coal can be transported in barges with a capacity of 100 tons each or thereabout, and under the most liberal estimate it can be docked at Pierre for $2 per ton. It can be shipped to Chamberlain and other points below at about $2.50, and can even be shipped from here by rail and delivered in Huron at about the same figure. It can be readily seen that the retailer can make a handsome profit and sell this coal at less than one-half the present price of Iowa coal. The quality for soft coal is good, and will compare favorably with the soft coal shipped from the other States. A company of Iowa men have purchased 3000 acres of these lands and incorporated the North Dakota Coal Company, and in order to ascertain the heating power of this coal an analysis was procured from S. W. Johnson, Professor of Theoretical and Agricultural Chemistry of Yale College: Water, 14 88; volatile, 36 72; fixed carbon, 44.51; ash, 3 44; sulphur, 45.—*Yankton Herald.*

Railway Earnings.

The net earnings of the railroads in the United States amounted for the first seven months of the present year to $95 408,090, against $103 535,117 during a corresponding period in 1889. This falling off, the first that has occurred for many months, has been due mainly to heavy decreases by a few of the large systems, the general condition of net earnings being better than the figures indicate. The principal cause for the decrease is a large increase in operating expenses amounting to over $3,000,000. It is also to be remembered that the result of operations for the month is being compared with a very favorable month last year.

Dam Failures have been numerous. The dam at the outlet of Bonesteel Pond, 12 miles east of Troy, N. Y., gave way Sept. 18th, and the flood carried away buildings, dams and bridges for several miles. On the same date a dam near the head of Broad Brook, in the town of Ellington, Conn., gave way, and the flood swept down the valley for eight miles to the Connecticut river, carrying out five dams, two railway trestles and six highway bridges. The total loss is set at $50,000. Highway bridges have been carried away by floods in many parts of New York and New England.

The high price and uncertainty of the supply of natural gas at Pittsburg have resulted in three large iron-mills going back to the use of coal for steam purposes. One mill at Alleghany has begun again the exclusive use of coal as a fuel. Natural-gas company managers believe the supply will soon be increased by new wells now under way, and point out that many industrial consumers of natural gas have used it extravagantly. The introduction of the meter system in connection with natural gas supplied to industrial establishments promises to induce more economy in its consumption.—*Bradstreet's.*

The Sequoia Park.—Secretary Noble has promulgated rules and regulations for the government of the park in Tulare county, containing the mammoth sequoias trees, created by Act of Congress and approved Sept. 25, 1890. The secretary christens it "The Sequoia National Park." The rules for its regulation are substantially the same as those covering the Yellowstone Park. The secretary said that if he found it practicable he would procure from a tract adjoining the park a section of one of the mammoth trees for exhibition at the World's Fair at Chicago.

The Pittsburg *Dispatch* predicts that by the end of this year the Pittsburg district will be producing 1000 tons a day more pig iron than formerly, or an increase over last year of 33⅓ per cent. The present capacity is about 3000 tons per day, of which 700 tons is mill pig and the rest Bessemer. The present year will see more blast furnaces erected or nearing completion in that district than ever before. In all, seven new furnaces have been projected.

The Philadelphia City Hall.—The tower of the City Hall is now 335 feet high, yet on top of that 8000 tons of iron and bronze are to be placed. There is to be a clock-tower, the dials of which are to be 27 feet in diameter, surmounted by a statue of William Penn 37 feet high, and there will be numerous statues,

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Butte.

THE GOLDEN GATE RIVER-BED ENTERPRISE.—Oroville *Register*, Oct. 4: This great work, under the supervision of Maj. McLaughlin, is being pushed steadily forward, an army of men with a great number of teams being employed on the dam, flumes and canal in course of construction. Some idea of the strength and magnitude of the dam here required will be gained from the fact that the Feather river carries here in the winter from 15 000 to 18,000 cubic feet per second. There can be no doubt but an enormous quantity of gold-dust will be taken out here when the company reaches that stage of the business.

Calaveras.

DROPPING THE STAMPS.—*Citizen*, Oct. 4: The 10-stamp mill of the Sandy Bar M. Co., which has recently been completed, commenced to drop stamps steadily last week. We expect to hear good reports from that property.

THE OLD PIONEER. — A rich strike has been made in this claim situated half a mile west of Angels Camp. The ore is rich in free gold. It will have to be crushed first and the free gold amalgamated, after which the sulphurets will have to be concentrated and taken to the chlorination works. The sulphurets assay from $128 per ton up to $700 per ton. No accurate or even approximate estimate can yet be made of the development, but from what is in sight the owners are satisfied that they have a fortune. This simply shows what industry, intelligence and scientific mining can accomplish. Mr. Hallock was led to commence operations at the present point of development, from his long systematic and scientific study of the meaning and application of mineralogy and geology.

Inyo.

INYO MARBLE QUARRY.—*Index*, Oct. 4: The mill at Verdi, on the Truckee river, Nevada, started up on Sept. 24th, in charge of Capt. Bronson. Mr. Paige, who superintended the erection of the mill and placing of the machinery, has returned and will assist in the management of the quarry. Just now nothing is being taken out except white marble for the Mills building, San Francisco. This is shipped to the mill for dressing, at the rate of two carloads per week. Moss agate and yellow marble for the interior of the building will be taken out later. Twenty men are at present working in the quarry.

SYLVANIA DISTRICT.—*Register*, Oct. 2: There are indications that Sylvania will soon be a booming camp, for some of the rougher features of society that inevitably cling to a new mining town are occasionally displayed in this camp, though thus far not to such a violent degree as was the case in the palmy days of Bodie. Three eight-hour shifts have been put on in the Liberal shaft, and they are sinking as fast as powder and muscle can do it. Work on the Climax mine is progressing favorably. Engineers Geo. Thorpe and Frank Higgs, with Furnace-men Preston and Davis, are busy getting the furnace, engine and blower ready for smelting.

Nevada.

ON THE LIBERTY HILL DIVIDE.—*Transcript*, Oct. 6: The Swamp Angel drift mine at Lowell Hill is now in rich ground and about 20 men are employed. The last family remaining on Remington Hill removed last week, and now that once populous section does not contain a human being. The East New York drift mine at Lowell Hill and adjoining the Swamp Angel, is doing so well that the force is being increased. Six men are now at work and weekly cleanups are being made. The shaft in the Ben Franklin mine is down 120 feet and is in good sinking ground, after having successfully passed through the 60 feet of caved ground, consisting of mud, sand and water.

THE IDAHO STRIKE.—*Tidings*, Oct. 7: We are informed by Mr. Edward Coleman that the new ledge cut in the Idaho shaft, near the 1800 level, about a fortnight since, holds its own and encourages the belief that a permanent vein has been discovered. This wonderful mine is likely to see the rise and fall of many other dividend-payers before the last ton of ore is dug out of its bowels.

GOOD ORE.—Many people who visited the pavilion during fair week will remember the exhibit of gold-bearing ore which was brought from the Washington mine. After the fair the rock, which weighed 1000 pounds, was milled, and from it was secured 2.81 ounces of pure gold.

HERMOSA MINE.—The owners of the Hermosa, who are all workingmen, have been busily engaged for some time in getting ready machinery with which to work their mine. Some of the machinery has been placed in position and in a short time they hope to be ready to start. The pumping machinery, rods, hohs, etc., from the Osborne Hill property will be used. They have every reason to believe that they will soon have one of the best prospect mines in the district.

Placer.

MINING GENERALLY PROSPEROUS.—*Republican*, Oct. 6: With the exception of the hydraulic branch of the business, now dead, mining is generally prosperous throughout this county, this having been with the drifters and the river-bed operators a fairly good year. The Hogshack tunnel is now completed a distance of 2510 feet. A perpendicular 5x8 feet upraise will be started up at once with Ingersoll drills which will tap the channel in about 170 feet.

Plumas.

VARIED DISPLAY. — Quincy *Journal*, Oct. 4: A fine display of gold-bearing quartz was on exhibition. The rock came from Rich Gulch, on the east branch of Feather river. The richest specimens were taken from the claim of Fred Lewis. In the collection was a bottle of free gold. There were also some rich specimens from the Hallsted ledge. These samples fully illustrate Plumas county for extensive ledges of gold-producing rock, and amply justifies the expenditure of capital for the development of this great industry. The lapidary collection is very interesting and brings to light the curious formation of some of the stones which may be seen every day, covering the mountain-sides and filling the gulches. The agates, particularly, are wonderful, and the water crystals might easily be mistaken for diamonds.

San Diego.

MORE QUARTZ-MILLS.—Julian *Sentinel*, Oct. 3: Three new quartz-mills are to be erected in Banner City immediately by the following parties: J. I. Minear, Capt. W. S. Kerr and the Gold King Mining & Milling Co. Step by step the forward movement goes on in this district and it will not be many days until "the Julian back-country" will be the theme instead of a by-word. Capital, energy, perseverance and faith are bound to win in the end, and they are all fast being brought to a culmination in this camp.

Shasta.

MINING NOTES. — *Free Press*, Oct. 4: A 10-stamp mill was loaded at the depot this week for the Gladstone mine near French Gulch. Eighteen bars of silver bullion were shipped this week from the Lost Confidence mine at Iron Mountain. Wm. Kellner took $600 out of a pocket near his cabin at Centerville. Several tons of ore from the Beecher mine, in the Lower Springs district, were unloaded at the concentrating works here this week. Sheriff Hopping has backed several miners in the county to the tune of $2000 in the past two years. Many good developments have been made through his liberality. It is reported that ex-Sheriff Ratchford of Modoc county has struck a rich ledge between Centerville and Texas Springs. He has hauled a quantity of rock to the concentrating works here. Matt Hume and Vivian have a valuable mine at Slick Rock, this side of Iron mountain. They have a tunnel in 60 feet, have crosscut the ledge and followed it 20 feet. The quartz is perfectly white and contains a liberal spattering of native gold. The ledge is two feet wide and promising.

Sierra.

GRAVEL AND QUARTZ.—*Mt. Messenger*, Oct. 4: About a year ago a company undertook to explore the country around Fir Cap and Saddleback mountains, believing that it contained much gold, both in gravel and quartz. Their ground includes the old Fir Cap gravel claim, from which was taken in early days $400,000. This was taken from a rich pot hole, which, being worked out and no more pay gravel found, operations were suspended. It is now believed that this gold was taken from a secondary and not from a primary pliocene gravel channel, and that large portions of a primary channel may be found near by, both north and south. While the original company was at work it discovered a promising quartz ledge, but did not prospect it. Just below this ledge many specimens of quartz gold were found, suggesting the idea that a paying ledge was near. John Mitchell owned the property many years, and it was he who organized the present company. Under his supervision, the old tunnel, over 2000 feet long, was repaired and the task of exploring the ledge begun, and although but just fairly started, quartz that prospects exceedingly well has been taken out, and it is probable that at no great distance a rich chimney may be found. That good gravel diggings may be found in the large flat above Fir Cap is more than probable, it being almost a certainty that a gravel channel runs, or at some time did run, from near Saddleback to Monte Cristo. This channel will be looked after later, it not being practicable to prospect both at the same time.

NEAR ALLEGHANY.—It is reported that richer quartz has been struck in the Grant & Appel mine near Alleghany.

MINING NOTES.—*Tribune*, Oct. 7: The lower tunnel at the Salinas & Mercer mine is to be run ahead. Five men are working there. The machinery for the Mountaineer ten-stamp mill is being hauled to the mine. That property is looking fine. Several hundred feet of tramway, reel, rope, dump-house, etc., has been purchased by the Chipps mine owners, from the Sierra Buttes company. A. J. Fraitas, who was injured in an explosion at the Young America mine some weeks ago, is now able to get around a little. Wm. Dawes has gone up to work on a gravel claim in the Gold Lake country. It is called the Downieville Mining Co. Messrs. Cook and Clark have arranged to ship 1500 pounds of ore from their mine at Meadow Lake to the Selby Smelter to be worked. They are confident of receiving big returns therefrom.

Trinity.

CANYON CREEK.—*Journal*, Oct. 7: The Fisher Gulch M. Co. has purchased a Huntington mill and will have it on the ground ready to set up in about three weeks. It will be run by water-power, a Pelton wheel being used for that purpose. C. W. Smith informs us that the force on the Bailey mine is now working on the ledge first tapped. As far as they have run the tunnel on the ledge the ore shows up well. Grigsby & Shattuck are getting in their mill as fast as possible, and will probably have it all on the ground in a few days, and in about 30 days they expect to have it running. All work in the camp is being pushed ahead and some time this fall it will be found what a few of the ledges contain.

Yuba.

RIVER-BED MINING.—Nevada *Herald*, Oct. 7: There are still many men working the channel of the Yuba river between Bridgeport and Mooney Flat, and a great deal of gold is being taken out. The miners, however, have one difficulty to contend with. There is a great deal of lead in the gravel, brought there from the mines, and this makes it somewhat hard for them to clean the dust after it is amalgamated.

NEVADA.

Washoe District.

ON THE COMSTOCK. — Territorial *Enterprise*, Oct 7: Col. Samuel Curtis has arrived to take charge of the Keyes property. He states that the new management intend to resume work on the property shortly, and that they will endeavor to make it pay. No change in the control of the Andes mine will take place until Wednesday next, when, it is reported, a clean sweep will be made of the old management and a full board of new directors will be elected. In the meantime an expert has been employed to examine the books of the company at the solicitation of Directors Hall and Turnbull.

Candelaria District.

DIVIDEND PAID.—The dividend of 40 cents paid by Mount Diablo last week was the first this year. It amounted to $20,000. It is the fifteenth, and makes a total of $180,000. There have been three assessments in all, amounting to $137,000, the last assessment having been levied in June, 1889. The mine has just shipped $10,671.

THE HOLMES MINE.—During the week ended Sept. 18th the Holmes mine had 322 tons of ore crushed. The battery samples averaged $25.80 per ton. A bullion shipment valued at $3712 has since been made.

Dun Glen District.

DUN GLEN.—*Silver State*, Oct. 7: Gen. Buckner, while at Dun Glen a few days ago, saw the proceeds of 7½ tons of gold-bearing rock worked in an arastra by Samuel Thomas. There were over 50 pounds of amalgam, estimated to be worth $4000, which would make the ore worth over $500 per ton. The Hendra brothers are running a five-stamp mill on gold-bearing rock, with good success. The ore pays well and the Hendras are getting rich, as they deserve. There are 26 Chinamen at work placer mining in Barbour Canyon, and several of them have made homestakes and are going back to China. Every canyon in the Dun Glen mountains abounds in gold, and there are undoubtedly rich gold-bearing quartz leads in the range.

RYE PATCH.—This old mining district, situated on the westerly slope of the Humboldt range, is coming into prominence once more. The Walton group of mines are once more attracting attention, and there is little doubt but some profitable bullion-producers will be opened up there before long. This district is close to the line of the Central Pacific railroad, besides which it possesses many other advantages that ought to recommend it to the favor of capitalists.

Hawthorne District.

FROM VARIOUS MINES.—Walker Lake *Bulletin*, Oct. 4: Not much is being said lately about the mines of this vicinity. This is not because we have not good mines, but because our people prefer to quietly develop the properties without making extravagant statements of the quantity and richness of the product. Through the kindness of Mr. Knapp, one of the owners of the Confidence mine, we are permitted to publish the following figures, showing the production of that mine for the past six months: Production from March 1st to Sept. 1st, 1890, $25,466. Dividends were paid during this period aggregating $12,800. The above yield was the product of 94 tons and 746 pounds. In addition to the ore shipped to the mill there still remain on the dump 400 tons of second-class ore. This ore averages 50 ounces to the ton. The mine is producing as usual, and the prospects are good for a large body of ore. The main drift is in 300 feet, and renders the working of the mine much easier than formerly. About 16 men are employed. The Eureka mine, situated 20 miles north of Luning, of which S. A. Knapp is one of the owners, is showing well. This claim shows three parallel ledges from four to six feet apart, ranging in size from three inches to two feet. The ore extracted is rich, assaying 1000 ounces per ton for first class and 100 ounces for second class. The Western Belle is attracting considerable attention just now. Taylor & Gilman are the owners. They are now sinking on the contact and the assays run up in the thousands. The vein is a foot wide and is improving as depth is attained. Three men are at work. Cook & Hamlin are working three men on the Central. This mine is the best producer now being worked in Hawthorne district proper. They are shipping about $1000 per month steadily. M. Martinez is extracting very good ore from the Lotta mine. Dave Millsaps reports that he has struck a streak of ore in the Horseshoe at Garfield which yields in the neighborhood of 1000 ounces to the ton. Kimball & Waddell keep two men going on the Early Dawn, with good prospects ahead. Geo. Olsen is taking out some excellent ore from the Hanover. The Woodchuck at Marietta employs five men. The owners are Messrs. Knapp, Purcell and Maguire. The ore is silver, lead and gold. About 200 tons have been shipped since January. The ore averages 40 ounces silver, $4 gold and 50 per cent lead. Two men are working in the Mountain King. A tunnel is now being run on a spur of the vein, extracting ore which yields 65 per cent lead and 160 ounces silver. The Pamlico is still closed down on account of litigation. The Lapanta and Baltimore will be started up this fall.

Humboldt District.

BURNED.—The Humboldt Reduction Works at Winnemucca were destroyed by fire early Wednesday morning. The property was owned by Alex. Wise, and was considered worth $25,000. There was $10,000 insurance on the works.

Schell Creek District.

DEEP CREEK.—Salt Lake *Tribune*: J. N. Dunyon of Tooele county has returned, bringing with him some fine samples of silver-lead ore from the Clifton mining district in the Deep Creek country. The specimens assay 400 ounces in silver to the ton. He also has in his possession a four-ounce phial full of coarse gold, which was taken from the rocks in that locality by crushing them with sledges. Deep Creek country will in time become one of the richest districts in the Territory, and the advent of a railroad into that region is only needed to hasten the day when thousands of tons of rich ore will be shipped from there to the Salt Lake Reduction Works.

Tybo District.

TYBO MINE. — Walker Lake *Bulletin*, Oct. 1: The old camp of Tybo in Nye county will soon be the scene of great activity. An English syndicate has purchased from N. S. Trowbridge & Co. the 2-G mine, mill and works, and the Dimmick mine from Luse and Dimmick. These mines have produced millions in times past, and there is every prospect of revival of their past prosperity.

ARIZONA.

YUMA COUNTY.—*Citizen*, Oct. 1: Skilled miners do not have to go out of Yuma county to make a "stake." If placer work is not tasteful, the muscular seeker after wealth can find a score of low-grade mines near the Colorado river in this county, which can be worked with profit and ease by concentrating, shipping to San Francisco and receiving therefor the bright and fascinating double eagles "in quantities to suit." La-Oche, an old Papago Indian miner, brought into town a few weeks ago gold dust to the amount of $59, representing one week's labor in the Gila City placers. This, of course, was a very unusual return in so short a time, but La-Oche says that he never earns less than $2.50 per day in the Gila City placers, and that without working very hard. J. Burns and Charley Lee, well-known miners, came in from the Pot Hole placers yesterday for the purpose of purchasing supplies. They report the mines in their district in a prosperous condition and producing gold in paying quantities.

MAMMOTH.—This camp is a blessing to the river, affording ready sale for nearly all the ranchers have to sell. The new road to the Oracle will give us relief, reduce the time in making the trips and the price of hauling. The camp is continually increasing and we look forward to the time when 100 stamps will be dropping. The Mammoth mill is now dropping 50 stamps day and night which reduces 100 tons of ore every 24 hours. There are about 50 men working in the mine and mill; six or seven are working in the stopes and knock down enough ore to supply the mill. There are about 30 men on development work in the mine. It is evident the mine is giving good returns, as the addition of 30 stamps recently indicates. An aerial tramway is to be put up at once from the mine to the mill, which is three miles distant, and it is said that 60 more stamps will be added to the mill within the next few months. The district is coming rapidly to the front, many prospectors are coming in and new buildings are being erected.

PLACERS.—From 40 to 80 Mexicans are at work constantly in the Greaterville placers, and make from 75 cents to $1.50 per day to the hand, working by their imperfect method. An effort is about being made to bring in water from the Santa Rita mountains, five miles distant. Should this succeed, a much larger number could find employment here at more than double the above wages.

GILA COUNTY.—*Silver Belt*, Oct. 1: The trial of working medium and low-grade ores in the Nugget mill will be watched with considerable interest. In case 40 and 50-ounce ore can be worked with profit, it will give an impetus to silver mining in this district, as there are considerable quantities of such ore within easy packing distance of the mill. In anticipation of the success of the experiment, miners have purchased the dumps of several mines at and around Quartzite and Richmond Basin, which they propose having worked.

ARAVICA.—Mining business is prosperous and improving. The Esperenza mine, which has been shut down for some time, will be started up again in the near future. P. Peyron having lately obtained possession of it intends bonding it to Eastern parties. The Austerlitz mine will be started up soon, having been shut down on account of the Aravica mill having been idle. The Yellow Jacket mine is working regularly and the machinery is now on the road from Tucson. The buildings are in readiness, and the new mill will be in running order about the 1st of January. The Old Stiff mine will be opened in the near future, as will several others in that region.

MOJAVE COUNTY.—The outfit, says the Mojave *Miner*, for testing the McArthur-Forrest process of working ores, which was ordered some time last month by L. L. Bequette for the Atlantic Mining Co., has arrived, and will be taken to the mine as soon as teams can be obtained to haul it. C. E. Sherman will soon commence work on the Independence at Chloride. He is putting up a new whim and getting things in shape to do considerable work before the year ends. Roges. Shippy & Shearick, who have a lease on the Altatta dump, have between four and five carloads of ore on the way to the sampling works. Henry Matsen is in from Ivanpah with three tons of rich rock. A strike was made on the Nellie Bly mine, in Wallapai mountains, by Wm. Morrison, who has a lease on the mine, from the owners, W. A. Neal and T. A. Groin. A three-inch streak which assays 800 ounces in silver and a two-foot streak which assays 80 ounces have been struck. Conkey and Bradon have thrown up their lease and bond on the Tuckaho mine. The sinking of the shaft on the Empire mine is now progressing at the rate of three feet a day. Messrs. James & Eames, who have purchased a number of mines in the neighborhood of Todd Basin and Cerbat, have decided to build a five-stamp mill at the junction of the Todd and Union Basin roads. The mill will be a complete one, and work on the foundation has already been commenced. Mr. Eames has gone to California for the machinery. T. W. Boggs arrived lately from Big Bug district with about $2000 in gold, which amount was recently taken from the placers. One piece to be seen at the Bank of Arizona is worth $15. A great deal of the gold was of the coarse order.

BRITISH COLUMBIA.

AT THE POORMAN MINE.—Nelson *Miner*, Sept. 27: The men here have been laid off on account of the scarcity of water in the mill ditch, but they were told that they would again be put on should the water supply be appreciably increased by rainfall. The last cleanup at the mill is reported the largest made during the run. Work on the tunnel to tap the ledge at a depth of 300 feet is expected to begin within the month, as there is sufficient water in the ditch to run a Burleigh drill, which will be used in prosecuting the work.

AT 49 CREEK.—It was expected that everything to begin hydraulicking would be in shape today, and that operations would be in full blast on Monday. There is no doubt of the existence of gold in the gravel in paying quantities, and the men who have put in the hydraulic plant are workers. A number of miners are sluicing above the hydraulic company's ground, and making wages. One of them, K. B. Brown, picked up a $5 nugget one day last week. Chinese are prospecting on the creek below the government trail, and are said to be meeting with good success. About 3½ miles up the creek from the trail, F. P. Price and Roderick McLeod have two quartz locations, the May and the Jenny, which show an oxidized ore carrying free gold. The ledges are from 4 to 6 feet in width. Last month a 250-pound sample was sent out to the Spokane Falls sampling works for a test, but returns have not yet been received.

ROVER CREEK.—At the head of this stream is situated a gold district, discovered by John Wallace in the summer of 1889. On a claim called the Whitewater, he and his associates are driving a tunnel, which is now in about 100 feet. The ore, in rose quartz, gives assays averaging $100 in gold to the ton. Joe Wilson expects to begin packing ore

from the Hall mines to the landing at Nelson on Monday. An ore-shed to house it has been erected on the river bank.

GRANITE CREEK.—Kamloops *Sentinel*, Sept. 27: This creek and its tributaries continue to yield a fair golden harvest to the miners engaged in the work there. The majority of the work is done by Chinamen.

OKANAGAN.—On the Monashee mines, development work is being pushed forward steadily. A new and very complete Pelton mill has been added to the plant, and the work of reducing the ores will be carried on vigorously in future.

IRON FOR SMELTING.—J. W. McKay has received an order from the Taconia smelter for 100 tons of iron ore from his Cherry Creek mines. The managers of this smelter who have tried a sample of the ore pronounce it of the very best quality—better than can be obtained anywhere else on the west coast. Should the 100 tons ordered prove of the same quality as the first samples—and unaoubtedly it will—all the ore of this class required by the Tacoma smelter will be ordered of Mr. McKay, who has evidently a bonanza within his grasp.

LOWER KOOTENAY.—Mining in the lower Kootenay continues brisk, with excellent showings at all the camps. An American Co. the other day offered Mr. McCrae, of McCrae & Keefer, owners of the Wild Cat, 10 bond their claim for $40,000.

COLORADO.

FROM ASHCROFT.—Aspen *Times*, Oct. 1: A strike has been made in Little Monument gulch just west of town. It is off the lime belt in the fissure vein country north of the famous Montezuma and Tam O'Shanter. It was in this gulch that Ashcroft (after whom the town was named) and his partner made the great strike in the early days. They took out of the North American mine $100,000, and it is said that Ashcroft skipped out with nearly all the money belonging to his associates. He was last heard of in New Mexico, but none of the treasure was ever recovered. The North American was soon worked out, the vein going down only about 200 feet. The ore was very rich, containing much native silver, and this find gave the town of Ashcroft its first boom. The new strike is in the property owned by F. A. Kinney and others. This is under lease to George W. Lloyd and others, and they started up work only a short time ago. They have uncovered a 3½-foot vein of ore that runs 38 ounces in silver and 45 per cent lead. Ever since those prosperous days, Little Monument gulch has held a high place in the estimation of the prospector, and the present strike bids fair to bring about a repetition of those early times. Prospectors have long held the gulch, doing annual assessment work, and each one has hoped to strike it bigger than the North American.

MONTE CRISTO.—They are taking out ore here every day. The mine is improving as they go in on the drift and gives promise of a good thing. They will make a shipment of 50 tons the first of the month. This ore will go to the new Thomasville smelter, which will blow in about the last of October. The flow of water from the Monte Cristo tunnel has decreased, greatly to the advantage of working the property.

STRIKE IN THE ASPEN.—A body of rich ore has been struck in the sixth level of this mine, at a point about 100 feet north of the electric incline, the latter being some 500 feet south of the shaft. The level had been run through it, showing it to be a chimney 25 feet wide.

OREGON.

PINE CREEK MINES.—Bedrock *Democrat*, Oct. 3: A large amount of ground has been worked this season and the output has been large, as the previous cleanups, not one of which has fallen below $12,000, will attest. The Robbins plant consists of a five-foot Byam mill, with a capacity of 12 tons per day, four Frue concentrators, and other necessary appurtenances for successfully reducing the ore. The machinery is run by a six-foot Pelton wheel, under 160 feet pressure, furnishing enough power to run two plants of a like capacity. The ore is conveyed from the mine to the mill by teams. Supt. Robbins says that as soon as arrangements can be perfected he will work his concentrates at the mill instead of shipping them to Denver, as is now done. He will either employ the chlorination or amalgamation process, both of which have been tested and gave satisfactory results. The concentrates go all the way from $60 to $235 per ton. The ore is rich in free gold, and from 96 tons, eight days' run, $2000 was realized. The ledge is 14 feet wide, solid ore, there being no waste at all. A contract has been let to run a 700-foot tunnel, which will tap the ledge at a depth of 300 feet. The tunnel is now in 350 feet.

THE BAISLEY-ELKHORN MINES.—The plant here consists of two 5½-foot Huntington mills, with a capacity of nine tons each per day, and two improved Frue concentrators, the machinery being run by steam. The mill is situated about 150 feet below the mine, the ore being conveyed by a tramway. The camp presents a lively appearance, there being a large force of men at work at both mines, which are only a few hundred feet apart. The character of the ore of the two mines is somewhat different, the Baisley-Elkhorn being more of oxide formation and the Elkhorn a sulphide. Upward of a dozen buildings are under construction, and on their completion the place will take on the appearance of a veritable mining camp.

DAKOTA.

BETTER ORE.—Deadwood *Pioneer*, Oct. 1: The last cleanup at the Monitor Co.'s mill was more satisfactory than that in August, the yield being about $5 a ton. This is the first cleanup from the virgin ground opened up a short time since. The workings there now show up a fine body of good grade ore.

FROM GALENA.—The Richmond, Cora and R. B. Hayes are making regular shipments of high-grade ore. From the Queen, ore is being mined and piled on the dump awaiting better shipping facilities. The new barrel at the chlorination works is set in place on the boxes ready to revolve. It is lined with one sheet of lead 7x17 feet in measurement. This is the largest sheet of lead lining ever used in a barrel, but this is the largest barrel in use. On the dump at the works there are now ready for treatment over 1200 tons of Golden Wedge ore, and by the time the barrel will be ready that amount will be increased to 1500.

ABOUT DEADWOOD.—On the Golden Reward, 25 miners are being worked, the extracted ore being treated at the Deadwood chlorination works. This is a blanket lode, lying quite flat. Its thickness has not yet been ascertained. The ore, found from the grass roots down, occurs in chutes divided by porphyry dykes. In an open cut on the south end of the Golden Reward is a face of ore nearly 80 feet in length, and of average thickness of about 8 feet. A main tunnel about 500 feet in length has been driven from east to west, crosscutting three distinct chutes of ore and exposing the presence of a fourth chute, at which point work has been stopped and a winze started to determine the depth of bedrock. This tunnel almost crosscuts the entire distance between the side lines of the two claims forming the Golden Reward property. A large quantity of ore has already been mined from the first and third chutes, which have been stoped from the caprock down. But in the second chute only a small quantity of ore has been mined, because it carried nearly equal proportions of gold and silver, and the works at present only treat gold ore, losing the silver. The average thickness of the ore bodies in these chutes, so far as developed, is about 12 feet, while the three chutes measure a total length of about 300 feet along the line of tunnel. This ore yields an average of $22 per ton. Four thousand tons were shipped to Omaha for treatment last year, with satisfactory results.

ON THE GOLDEN WEDGE a shaft has been sunk 30 feet deep, but not to bedrock. At the bottom the deposit has been crosscut by a drift 80 feet long, 30 feet of which cut through a porphyry dyke. The ore bodies exposed so far as work goes at present, show an average thickness of about 8 feet, and the ore so far has yielded richer than the Golden Reward.

IDAHO.

ABOUT QUARTZBURG.—*Statesman*, Oct. 1: The G. & S. M. Co.'s quartz-mill is running to its full capacity and a large force of men is employed night and day, the ore produced being of the best quality. Chris. Peterson has charge of the crushers, etc., in the mill. G. H. Faul is kept pretty busy clearing away the ore as it comes from the mine.

AT WOOD RIVER.—Pat O'Donnell and Pat McMongle, lessees of the Parnell mine in Narrow Gauge gulch, have about 50 tons of ore out on the dump, of which about 20 tons are first-class, worth about $150 per ton, and are extracting more right along. As soon as they get 40 tons of second-class ore on the dump they will ship it and lay in their winter supplies, in order to open the property sufficiently to justify the construction of either concentrating works or hand-jigs next spring. The Standard Co.'s mine shows a foot of solid ore, but, although this is between the 4th and 5th levels, at a depth of about 375 feet from the surface, the developments are not sufficiently extensive to demonstrate the extent and value of the ore body.

STRIKE IN THE OPHIR.—The recent cutting of a big and rich ledge in the Ophir mine at a depth of 250 feet means the early employment of a large number of additional miners in this camp and a consequent increase of business.

FLINT DISTRICT.—*Avalanche*, Sept. 27: Work has again been started on the mines in Flint district which were purchased last year by Denver parties. A new survey has been made on the tunnel run last year and another effort will be made, through it, to reach the chimney of ore found in the shaft. A battery of 10 stamps is now on the way here to be put into the big mill at Flint by parties who have leased that property. The costly mill built there some years ago by the Flint M. Co. proved to be a very expensive experiment. The rolls with which they tried to crush the ore would not work, and the system of concentrators they attempted to operate were equally a failure. The lessees now go back to the old stamp process, and with roasters will try to work the refractory ores. The ores in the Flint mines are high grade and just sufficiently refractory to prevent good results without roasting.

RICH GOLD ORE.—Dave Farmer and Fred Grete, Jr., who have for some time been working a prospect near the head of Coffee gulch on the south side of Florida mountain, have at last struck what promises to turn out a big gold find. They have sunk a shaft 30 feet deep on what now shows it to be a true vein some four feet in width, with a pay streak in it of one foot of very rich ore. They have brought down specimens literally flecked with gold. One specimen weighing fully 20 pounds, it is claimed will run more than $1000 per ton.

MONTANA.

MINES IN DEER LODGE.—*New Northwest*, Oct. 1: The ground of the Silver Crown has all been prepared for the reception of the hoisting machinery. Part of the machinery, including the 45-horse power engine, is now on the ground, and the other machinery is arriving day by day and is being placed and put in order as rapidly as possible, and by the middle of next month the company expects to hear the rattle of the works and be sinking farther toward the center of the earth. This promises to be one among the finest properties in Deer Lodge county. The crew at the Lion has been increased. The company is still crosscutting in the 300-foot level, north and south, and is stoping and taking out ore from the 200-foot level, the assays from which are very favorable.

THE MONARCH MINE lies on the west slope of Bison mountain at the head of the Little Blackfoot and about 15 miles a little north of east of Deer Lodge. The lode has been opened by shaft and tunnel. It is the intention of the company to follow the chute of ore along the lead with the tunnel for about 150 feet, after which they will put on machinery and sink farther on the lead. There have been about three carloads of ore taken out of the shaft, one of which has been shipped and the others are now being hauled out for shipment. The carload shipped brought silver, $641.39; gold, $115.60; lead, $153.40. total, $910.39. Less freight and treatment, $261.26; net, $649.13.

ABOUT BUTTE CITY.—*Inter-Mountain*, Oct. 1: The Lexington Co. is developing the lower working, sparing neither time, money nor expense. Ore sufficient is produced above the 600 level to keep the mill running as usual. Fine-looking leads are being cut by the many sewers that are being dug through the principal streets of the city. Assays made from one cut on East Mercury returned 34 ounces in silver. The Rock Island is one of the prominent and most remunerative leases in the camp and is operated by the Voulton boys. Shipments are regularly made to the reduction works. The Buffalo continues to pump water and the drift from the mountain to connect the Buffalo property is being pushed. Some ore is being taken from the St. Lawrence mine and shipped to Anaconda. It is expected these properties will start up on a much larger scale during the coming month. The Alva has a small hoist erected on it and shipments of ore were made yesterday. The Prospect, south of the Orphan Boy, is taking out some rich ore and sacking it for shipment. The new engine-room and all the other necessary buildings, with the exception of the shaft-house, on the Germania, have been erected, and shipments of ore are being regularly made. The Blodget boys continue to have hope in the Hope, and they are developing on the 200-foot level. The Anselmo is virtually shut down. This mine has about the largest ledge in the bottom of the shaft in the Missoula gulch locality. Ernest Sticht, the assayer on Upper Main street, has made some very flattering assays of local properties the past week, all speaking well for the future prosperity of this city. Improvements continue to be performed at the Belle of Butte mine. Wood is getting a little scarce at some of the mines and it is feared by some that the fire that lately consumed in the neighborhood of 200,000 cords will have the effect of raising the price of that article in the near future. The foundation is about completed for the engine-room and the shaft-house of the Lewisohn shaft, and the buildings are fast being erected. The two Colusas and other properties of the Boston & Montana continue to work at their regular capacity.

UTAH.

WORK AT BINGHAM.—Salt Lake *Tribune*, Oct. 5: Mr. Franklin is now working 75 men and putting out, mainly from the Utah, $600 or $700 worth of ore per day. Mr. Holden has put out about 1000 tons a month from his Bingham property the past three years. Mr. Franklin regards his Bingham property as more valuable than any other in the Territory, not excepting the Ontario, the Beck-Bullion, Eureka Hill, Mammoth, or any other mine. He has the settled conviction that working is what mines require to make them profitable, and he seems to be able to command all the capital he needs.

WASHINGTON.

IRON ORE.—Colville *Miner*, Sept. 30: The Tacoma smelting and refining works are to receive weekly two carloads of iron ore from Mr. Hammond's Clugstun Creek mine, to be used for fluxing purposes. Mr. Hammond will begin to-day with teams to load the ore for shipment. He has also had shipped to the exposition two tons of ore from his properties, which will be placed in the Stevens county exhibit.

A DEPOSIT OF FIRE-CLAY has been discovered in King county on the line of the Seattle, Lake Shore & Eastern railroad, which is said to equal in quality any of England's production. A company with a capital of $10,000 is being incorporated for the purpose of developing the find, and as soon as possible will begin the manufacture of brick for furnaces and ornamental purposes.

Mining Share Market.

The market has held dull, but at slightly higher prices. The strength of the market, in the face of assessments levied each week, is a source of surprise to many, but to close observers the surprise is that more strength has not been exhibited, with prices ranging higher than for some time past. This opinion is grounded on the well-known fact that stocks have been and still are being concentrated, while the nature of the work in the mines presages important prospecting or developing work in several at an early day.

In outside stocks, Central, in the Quijotoa district, has been more active under buying orders from Arizona. The Tuscaroras have been steady, with a firm tone under light trading. The Bodies broke back under fair sales, but this (Thursday) morning Bodie made one of its characteristic cat-like moves, jumping up from $1.45 to $1.90 bid. The moves up and down in these stocks come like a thief at night—without warning.

The *Exchange*, a daily four-page paper, is launched on the journalistic sea. It is devoted chiefly to the stock market and makes quite a creditable appearance.

From the mines our advices report that the 600-foot level in Alpha, the 1000-foot level in Challenge and Confidence and the 1200-foot level in Potosi and Chollar are to be opened up. Official letters received to-day report that in Confidence they are repairing and timbering preparatory to prospecting for ore. In Seg. Belcher, important prospecting work is under way, as there is also in Overman. Connection in the Potosi winze with the Chollar 1200-foot level will be made soon, when that level will be opened up by a series of crosscuts. The Savage and Hale and Norcross letters do not contain anything particularly new. The official letter from Kentuck reports the prospects very encouraging for a development in the east drift on the 1000-foot level, and one in the west drift on the 950-foot level. Assays of ore in the latter level were as follows: Sept. 30th, $71.79 per ton; Oct. 4th, $39.29; and Oct. 7th, $52.19. But the letter fails to state how wide the vein is from which the assays were made. An assay was made on Oct. 4th, the ore of which went as high as $1079.80 per ton, but the quantity was small and coarse. The latter assay is evidently misleading.

From the outside mines the news from the Tuscaroras and Quijotoas continues encouraging. From the Bodies the news is of an exceedingly favorable character. The mill started up on last Monday. From Bodie's official letter, Oct. 4th, received to-day, we obtain the following: "We have repaired the 'Old Bodie' shaft and commenced to hoist ore. In upraise above the 400-foot level west of 'Old Bodie' shaft we have very rich ore. We are stoping out good ore on the 500-foot level Jupiter shaft. We are preparing to stope out ore north and south from No. 2 North drift, west of shaft on 700-foot level."

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 30, 1890.

437,322.—LAWN-SPRINKLER—R. Addison, Pasadena, Cal.

437,548.—PACKAGE TIE—W. H. Anderson, Riverside, Cal.

437,558.—WHIFFLETREE HOOK—C. W. Blackburn, Tombstone, A. T.

437,565.—FLOWER-POT—Amanda J. Byrne, Tuscarora, Nev.

437,576.—CHECK BIT—Harris G. Cox, San Jose, Cal.

437,293.—COIN-ACTUATED TELEPHONE ATTACHMENT—H. F. Dugan, S. F.

437,300.—AIR BRAKE—L. Guillemet, S. F.

437,599.—ASTHMA REMEDY—Iselin & Callahan, Riverside, Cal.

437,494.—LIMEKILN—Wm. Jones, S. F.

437,213.—HOSE-COUPLING—B. F. Levet, San Diego, Cal.

437,499.—EXPLOSIVE COMPOUND—D. Mindeleff, S. F.

437,510.—TELEGRAPH KEY—A. F. Purdy, Lawrence, Cal.

437,511.—WATER-POWER—Quain & Warner, Albany, Or.

437,634.—CAR-COUPLING—Strathmeier & Guttenberger, Sacramento

The following brief list by telegraph, for Oct. 7, will appear more complete on receipt of mail advices:

Arizona—John A. Boyce, Phœnix, gate. California—Henry Egbers, S. F., harness tool; Charles O. Farclot, S. F., burglar alarm attachment for alarm clocks; B. Grider, La Grande, grain-cleaner attachment; Peter H. Jackson, S. F., basement and sidewalk construction; Elias Jacobs, Petaluma, safety-pocket for garments; Frank Kelly and W. A. Williams, S. F., plasterers' tools; Patrick J. Moore, S. F., oil can; Theron Palmer, San Bernardino, desk, toilet and display bottle; Francis Speed, S. F., pipe machine; William Schwabel, S. F., assignor of one-half to W. H. Holmes, Stowe, Cal., attachment for lathes; Philo N. Tyroo, S. F., bat-fastener; Marshal Wheeler, S. F., mounting terrestrial globes; William H. H. Wright, S. F., assignor of one-half to T. E. Johnson, San Jose, school-ruler.

NOTE.—Copies of U. S. and foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CHECK-BIT.—Harris G. Cox, San Jose, Cal. No. 437,576. Dated Sept. 30, 1890. The object of this invention is to provide an improvement in that class of supplemental bits known as "overdraw-checks." The especial feature is the two connected bars of the bit, extending transversely across the horse's mouth, with swivel attachments for the rear bar and nose strap connection, which attachments allow the front portion of the bit to drop down and relieve the mouth of the animal from pressure as long as the head is held in the proper position.

TELEGRAPH KEY.—Arthur F. Purdy, Lawrence, Cal. No. 437,510. Dated Sept. 30, 1890. The improvements in this key lie in the employment of peculiar guides for the key lever which permit its free up-and-down movement while avoiding and preventing any lateral play; in an adjusting spring and screw located at the extreme end of the key lever, which give a nice adjustment to suit the taste of the sending operator, and in conically-shaped contact points, which avoid that common difficulty known as "sticking."

FLOWER-POT.—Amanda J. Byrne, Tuscarora, Nevada. No. 437,565. Dated Sept. 30, 1890. The object of this invention is to construct a pot which shall be light, durable, tight and capable of being opened so as to remove the contents at will. It consists of two metallic sections, each forming one-half the pot, hinged together on a vertical line at one side and having means for securing the meeting edges on the opposite side and a circular bottom, one edge of which is fixed to one of the halves and the other adapted to fit in a groove or channel in the opposite half so as to make a tight joint when the parts are closed together.

LIME-KILN.—Wm. Jones, S. F., Cal. No. 437,494. Dated Sept. 30, 1890. This kiln is specially adapted for the burning of Portland cement, clinker or other substances requiring a high degree of heat. It consists in fire-chambers having a vertical shaft in which is located an open-ended tube through which the material to be burned is dropped. This tube passes through the fire-chambers and has side openings within said chambers. A revolving cylinder feeds the material to the top of the tube, and the chimney and feed-chute are located at the outer end of this cylinder.

Our Agents,

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Modoc and Lassen Cos.
T. B. LESIEUR—Humboldt Co.
GEO. WILSON—Sacramento Co
J. P. QUINETTE—San Francisco.
J. C. HOAG—San Francisco.
SAMUEL CLIFF—San Luis Obispo Co.
W. W. THROBALDS—San Bernardino, Cal.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
E. H SCHAEFFLE—Calaveras Co.
W. B. FROST—Marin and Sonoma Cos.
GEORGE EVANS—Santa Clara Co.
MRS. HELEN B. KING—San Benito Co.
MRS. M. E. DUDLEY—Ventura Co.
ANDREW REID—Monterey Co.
B F. BELT—Shasta Co.
WM. M. HILLEARY—Oregon.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.
H. G. PARSONS—Arizona and New Mexico,
R. G. HUSTON—Montana.

MECHANICAL PROGRESS

Working Cast Steel.

Why It Cracks in Hammering and Tempering It and How to Prevent This.

TOMBSTONE, ARIZONA, Aug. 29, 1890.

Editor Mining and Scientific Press, San Francisco—DEAR SIR: Having vainly tried to gain information on below-mentioned subject, I come to you to see if you can help me out of the difficulties I am encountering.

You will notice on the piece of steel I forward to you for inspection a number of cracks which made their appearance on the drill from which it has been cut, being heated and hammered out. What causes these cracks? What will prevent them? The drills are used in limestone, are always washed before being heated, are plunged in a solution of salt and water, are neither heated too hot nor hammered too cold. Five different blacksmiths, some of them experienced tool-dressers, have tried to dress the drills without any of them having so far succeeded in preventing those cracks from appearing. We have tried different qualities of steel, of American as well as of English make, but always, after five or six heatings and redressings of the new steel, the cracks will make their appearance, whether stone or charcoal is being used for fuel.

You will oblige an old subscriber by kindly informing me through your valuable paper what the cause of this peculiar action of the steel may be and how it can be prevented. Hoping you will be able to assist me in this matter, I remain yours truly,

S. H. BRYANT.

We have taken the piece of steel sent us by Mr. Bryant, together with his letter accompanying it, and submitted the same to two well-known experts in all that relates to steel, obtaining from each his opinion in regard to the trouble complained of, which opinions are here given.

Ahner Dohle, a manufacturer of and dealer in steel all his life, believes the trouble is due mainly to the inferior quality of the steel used in making these drills. The remedy he suggests is, the employment of none but the best of steel in the manufacture of these and similar implements.

Capt. Samuel Tyler, an expert mechanic and practical tool-maker, while admitting the possibility of the steel used in the manufacture of these drills having been of an inferior quality, is still of the opinion that the piece of steel sent us has been overheated and partially cooled down before hammering. He says the practice of heating tools red-hot and then plunging them in cold water to harden them, injures the steel, and if persisted in, ruins it entirely. He finds that if drills heated a little above a cherry-red, and "set up" always in hammering, have the points touched in a dry mixture of horax with a little salammoniac, there will follow a rewelding of any cracks that may occur in the metal. After this sharpening the drill should be laid aside on the forge to partially cool, after which the points only should be heated to a low red heat and carefully tempered in clean water, no salt being needed. He thinks he could take the cracked drill point sent us and draw it out into a fine-tempered knife-blade.

In the fire only the best kind of coal, such as Cumberland, or charcoal, should be used. The coals of this coast contain too large a percentage of sulphur for the successful working of cast steel.

Success in the Direct Method of Making Iron and Steel.

The dream of iron metallurgists for years has been the discovery of a commercially successful process for the production of iron and steel direct from the ores. Every metallurgist knows that the best iron and steel that the world has ever seen were produced by some one or other of the wasteful and expensive direct processes that were in use in the early history of iron and steel production. The iron from the run-out fires of the Catalan forges is the very high-priced and pure iron that is used in producing the best qualities of crucible steel, while the Wootz steel of India, made by the natives direct from the ore, gives a cutting edge that modern methods have found it impossible to reproduce. But these methods are so expensive that for ordinary purposes it is impossible to use them, and hence no end of thought, experiment and money have been devoted, especially within the last 50 years, to the discovery or development of a process that would permit of the production at will of the highest grades of iron and steel, and which at the same time should be cheap enough to permit its use in nearly, if not all, manufactures demanding iron and steel.

The records of the patent offices of this and other countries show no end of patents for this purpose, but until quite recently trials of the processes on a commercial scale have resulted in commercial failure in one or more particulars.

The difficulties in the way of a commercially successful direct process have been chiefly four.

The first difficulty has been an incomplete reduction of the ore without excessive waste. This applies equally to processes where the gas has been passed through the ore body under treatment, to the retort process and to the hearth process, either with or without the canister. The ore under such circumstances is likely to come out except under conditions of practice that are extremely wasteful, only partly reduced, or some wholly reduced and some not reduced at all, making not a sponge, but a mixture of sponge, half-reduced ore and ore in its natural state, heated.

The second difficulty comes from the fact that where most direct processes are continued for a sufficient length of time to effect a complete reduction of the ore, the waste or the expense of the process is so great as to preclude its commercial employment.

The third difficulty has been that the length of time necessary for the reduction of the ore has been so great, and the output per furnace so small, that a plant to give even a moderate production would be an exceedingly expensive as well as extensive works. It would require a large acreage as well as a great number of reducing furnaces.

The fourth difficulty has been too high heat in the reducer, giving irregularity of product, if not such conditions in the reducer as scaffolding or melting, as to stop the operation.

It is evident that a direct process, to be commercially successful, must have at least four characteristics:

1st. The metallic iron in the ore under treatment must be completely reduced from its ore condition to that of metallic iron, or metallic sponge.

2d. It must not be wasteful of the metallic iron in the ore. If possible, for every 100 units of iron in the ore there must be produced 100 units of metallic iron in the sponge.

3d. It must take the minimum of time, the minimum of capital in plant and the minimum of acreage. That is, the process must not be excessive as to time or fixed charges.

4th. The conditions of heat in the furnace must be such as to prevent all danger of clogging or stopping the process either from reoxidizing the ore or from gobbing or bunging up the furnace.

So many experiments have proven such absolute failures that practical metallurgists have been inclined to question whether it was possible to find a direct process that would answer these conditions.

As to its future, if it were discovered, there could be no question. A successful direct process, successful under the conditions named above, meant a complete revolution in the iron and steel industry, and meant the production of the very highest grades of steel at prices equal, if not below, those at which the cheapest grades are produced at the present time. While metallurgists, especially those who have had any experience in the last 20 years, did not say positively that a direct process answering these conditions could not be discovered, every one, without exception, looked upon an inventor who presented them a new process in this line as a "direct-process crank." The metallurgical Thomases, when news of the appearance of a new direct process was brought to them, numbered about as many as there were metallurgists in the country. We confess ourselves to have been of this number.

Within the past six months, however, we have come to question the correctness of our conclusion, as the result of the information we have received regarding the Adams direct process, which has been tested at Indianapolis and is now being tested in Pittsburg. There is every indication that at last a successful direct process, operated under the conditions named, has been invented.

It is not our intention at the present time to give a description of the Adams furnace. We can only say here, in a general way, that the furnace in construction is approximately a small blast furnace with a regenerative checker-work on the sides. In its working, the ore under treatment is brought constantly and thoroughly under the influence of the reducing gas, the reduction being performed in a remarkably short space of time, in the most thorough manner, at a small expense and with no loss of iron.

The sponge is used in connection with the open-hearth process, practically taking the place of so much scrap iron or blooms, making the process the "pig and scrap" or the "pig and blooms."

The process shows some highly interesting results in the elimination of phosphorus, especially when low phosphorus ores and irons are used, the results in some cases with such irons being even better than the basic process. The tests of the steel also give some remarkable results.

We hope to show in the near future that Holly's assertion that open-hearth steel would be made as cheaply as Bessemer, or, as he phrased it, that "open-hearth steel would attend the funeral of Bessemer," was not wrong, and it is especially fortunate that this announcement should be made just at the time our English fellow-metallurgists are coming in such great numbers to this country.—*American Manufacturer.*

FAILURE OF STEEL AXLES ON THE EAST INDIA RAILWAYS.—In addition to what was said in this column, in our last week's issue, in regard to the failure of steel axles on the East India railways, we now add the following from a Bombay paper, which says that the complete failure of steel axles in the rolling-stock of several of the Indian railways is a serious matter between the Bengal and Northwestern, and the Bombay Baroda and the Southern Mahratta lines. There is something like 50,000 of them. These axles, which cost originally about £1 2s. 6d. each, will have to be replaced by axles of wrought iron, costing about £2 5s. each—an expenditure among the companies concerned of something like £100,000. Moreover, the discarded axles will, it is said, be valueless.

SCIENTIFIC PROGRESS.

Peculiarities of Compass Variations.

During all the centuries that the mariner's compass has aided the navigator, it has not been possible to obtain one which would point directly north or south, or of which the variations under all circumstances could be accurately known. The magnetic pole of the earth is not the north pole, and it is continually changing, steadily moving westward, though not at any rate which can be predicted from year to year. The line of no variation has worked from the middle of the Atlantic to Pittsburg in about four centuries. Then there are variations due to the ship itself, to the material of which it is built, and perhaps in some undiscovered way to the construction of the compass itself, as in some iron ships no two compasses agree. In great storms, such as hurricanes and typhoons, the compass sometimes spins around in a manner so as to make it entirely useless and to indicate that things are unhinged generally.

As magnetism and electricity are continually changing according to changing temperature, winds, storms, rains and probably locality, these variations must be expected to go on forever, and the only question is how to manage them and how to learn sufficient of them so as to be able to calculate a ship's course with practical certainty. It may be possible to measure the variation in particular ships in the localities in which they are lying, as proposed by Capt. Easterby, but who will account for variations after leaving there or under so many varying circumstances as occur at sea? There are innumerable circumstances that may cause a variation in the needle. The rays of the moon concentrated on it have been known to cause a variation of five degrees. Now, on different moonlight nights this would be different, and on cloudy nights would not be felt at all.

Other similar circumstances have their effect, and perhaps many not now known. The danger of course is when near the coast on a dark night or in a great storm, and on these occasions the compass is likely to behave itself in the most erratic manner possible. For instance, Capt. Shire of the bark Easurain, who many years ago was caught in a severe typhoon, writes: "I will mention another circumstance that may be perhaps interesting, as it was certainly new and startling to me, and that was that we could get none of our compasses to remain steady, but at every succeeding burst of the heavy squalls they spun round and round, eight points at a time, and we had no other means of steering but by the roll of the sea and the feel of the wind on the back of the head, and this continued for some time after the gale had passed and rendered the approach to the land upon any safe course very precarious."

The probabilities are that on account of the continually varying aspect of earth, sea and sky, no measure which will meet all cases can be found, and that in the future, as in the past, the safety of ships, passengers and cargo must depend on the skill and knowledge of the captain, to whose charge the vessel is intrusted. —*Exchange.*

MECHANICAL STRESS AND CHEMICAL CHANGES IN ROCKS.—The subject of chemical changes in rocks under mechanical stresses was treated recently by Prof. J. W. Judd, in a lecture before the London Chemical Society (reported in *Nature* of May 29th). The action of pressure as influencing chemical affinity and producing modifications of structure revealed by the microscope, has been the object of much experimental investigation of late years, and Prof. Judd's lecture is mainly a review of the conclusions drawn from these experiments. Two kinds of pressure are to be distinguished; first, statical pressures arising from a great mass of superincumbent rocks; second, dynamical pressures resulting in movements within the earth's crust. The tendency of pressure is to produce crystallization in cases where contraction occurs. This crystallization may, however, be unstable, as has been illustrated by crystals thrown up by volcanic action from great depths. In many cases these soon become corroded and honey-combed through chemical changes permitted by removal of pressure. Many of the recent experiments have related to the increase in the solvent action of water caused by pressure, the facilitation of chemical reactions by the presence of water and other liquids, and to the promotion of chemical changes in masses under conditions of intense strain. These and other subjects are fully treated by Prof. Judd. In regard to the origin of the heat which causes metamorphism and kindred phenomena, the author believes that it cannot be attributed to any great extent to dynamical pressures, as from the probable slowness of earth movements thus caused, the amount of heat produced seems insufficient to account for high temperatures, as the opportunities for dissipation of thermal energy are so numerous.

A 10,000 DOLLAR THERMOMETER.—"The finest thermometer in this country, and I suppose in the world, is at Johns Hopkins University," remarked Lieut. Finley, Government signal-service inspector. Lieut. Finley inspects a great many thermometers every year, and he knows something about them. "This remarkable instrument," he continued, "is known as Prof. Rowland's thermometer, and is valued at the enormous sum of $10,000. It is absolutely perfect, and so fine are the graduations on the glass that it requires a telescope to read them. There are a number of fine instruments that are rigged with telescopes, but an instrument like that would be of no possible use to an ordinary individual. It requires a scientific education in order to read them."—*Jewelers' Review.*

BEGINNINGS IN WEATHER SCIENCE.—The history of meteorology has been made a subject of investigation by Dr. G. Hellmann. He finds that it is not exactly known who first kept a regular meteorological journal; but Humboldt attributes it to Columbus on his first voyage to America in 1492, while the Italians also appear to have made daily observations from the middle of the fifteenth century. The oldest of the meteorological instruments is the wind vane. The qualities of the winds were correctly described in the periods of Homer and Hesiod, in the ninth and eighth centuries B. C., while the first arrangement for observing wind direction was the Temple of the Winds, at Athens, built about 100 B. C. Eginhard, in the reign of Charlemagne, denoted the winds by the four cardinal points. The first instrument for denoting wind force—essentially the same as the pendulum anemometer now used—is ascribed to Robert Hooker, in 1667. The absorption hygrometer was invented about the middle of the fifteenth century, by N. D. Cusa, and the first condensation hygrometer is credited to the Grand Duke Ferdinand II of Tuscany. The first continuous hygrometrical observations appear to have been by R. Boyle, at Oxford, in 1666. The first thermometer is attributed to G. Galilei, toward the end of the sixteenth century. The first rain-gauge was used by B. Castelli in 1639. The first barometer was made by Torricelli in 1643.

FORCE AND POWER are often mixed by engineers writing hastily. Force can never apply to work done, but is expressed in intensity only. The instant it acts through space, work is performed and power results. Force is a single factor, but power is the product of the two factors, force and distance, that includes time. Power is constant because a product, but force may be changed. The energy in a moving body may be made to give a great amount of force in moving an object a little distance, or its force may be very small in overcoming a slight resistance and moving it through a greater distance. The energy of the moving mass, the resistance and the power developed are all unchanged, but the force can be changed.

LONG DISTANCE TELEPHONING.—We are living in an age of wonderful accomplishments and therefore do not, perhaps, realize as we might some of the feats attained by science and inventive skill. It was looked upon as one of the greatest accomplishments of civilization when the opening of the Atlantic cable made it possible to communicate between two countries separated by 3000 miles of water in a few seconds' time, and yet we are told that a telephone line has been successfully worked between St. Petersburg and Boulogne, a distance of 2464 miles, and that Russian engineers propose talking 4665 miles. Truly the progress of the nineteenth century is astonishing almost to incomprehensibility.

HIGH ROTATING SPEED.—One quarter-inch mule spindles have been run as high as 30,000 revolutions per minute. Some one in the *American Manufacturer* claims to have obtained a speed of 500,000 revolutions a minute, whereat the editor, after questioning the accuracy of the computations, very sensibly asks: Is there any special utility in securing, even experimentally, such a high rate of rotation? Beyond the satisfaction in attaining, say, to a million turns per minute (equal to 4166 turns in the period of a watch tick), is there any mechanical or physical end to be gained by it?

FORMATION OF OZONE.—In the course of recent experiments in England, a curious effect was observed, namely, that the formation of ozone is hindered by the presence of oil of turpentine and that the electric conductivity of the air at once disappears when some of the vapor is introduced. Not only turpentine, but several of the essential oils, when acted upon by atmospheric air, transform a portion of it into ozone, and again turpentine will absorb ozone without decomposing it.

UNDERGROUND WIRES.—For some years a record of storms, magnetic disturbances, etc., has been kept at the Berlin postoffice. The results show that underground wires are much less disturbed by magnetic storms than overhead wires, while, on the other hand, accidents from lightning are much less serious in towns where the overhead system prevails.

SITTING DOWN.—An English scientific person has discovered that sitting down is an acquired habit. The majority of mankind do not sit, but simply squat, or, as it is sometimes said, sit on their heels. This position, the scientific person thinks, is the natural one, while sitting on a chair is an artificial one.

PROF. HAZEN suggests that the force of a tornado may be largely diminished by the explosion of gunpowder or dynamite, just as the waterspout at sea is diverted and broken by a like discharge of explosives.

GOOD HEALTH.

Poison Oak or Poison Ivy.

The genus *Rhus* (sumac) is a genus of many species, with a habitat worldwide, and (as is not generally known) nearly every species will poison some persons cruelly, and if they do not soon get relief they will suffer terribly. Other people may handle nearly every species with impunity and then strike one, harmless to most persons, but capable of giving them a dose long to be remembered. Some persons may be poisoned by all except the white, or staghorn, sumac. This is the only species that I have not known to be poisonous.

Of the genus in North America, the swamp sumac, *Rhus venenata*, the climbing sumac, *R. toxicodendron*, and its variety or so-called species, dwarf sumac, *R. pumila*, and its variety on this California coast, *R. toxicodendron*, var. *Californica*, are the most to be dreaded. These last three are vulgarly called "poison oak" or "poison ivy," and the first is known in the Eastern States as "mercury."

While living in the East, up to the age of 30 years, our "poison oak" there was a fearful terror to me, and caused me a great amount of suffering. Then on until I was 50 it was innoxious. The variety on this coast is exceedingly plentiful on nearly all uplands, and is closely allied to ours, but is injurious to many more persons. The first time I went among it, it poisoned me from head to foot, and so it did a friend who was with me, also a new-comer here, who could handle without harm both it and *venenata* East. It laid him upon his back in great suffering for about a week. Pioneers here say that after a time the system becomes inured to it, and it does not injure them. But it does just rap it to the thin-skinned city dudes!

Remedies.

Many simple things will relieve and cure all forms of this poisoning, such as sugar of lead, sulphate of zinc, saltpeter, and muriate of zinc in solution with water. I do not know but I have discovered the best, handiest and cleanliest of these, to wit, a saturated solution of

Saltpeter.

I asked an old hunter what he used to cure poison oak with. He answered: "I wet some gunpowder and rub it on, and it kills it on me every time, if I put it on as soon as I feel it." Thinking that the only thing in the gunpowder that would do any good was the saltpeter, the next time I got a touch, all over my face, I tried it, and sure enough I felt the pain no more, when, in a few hours, if I had not got relief, my eyes would have been swollen shut. Now I keep a strong solution of saltpeter handy in my office all the time. Saltpeter is, of course, the nitrate of potash of the drug store. Nitrate of soda would probably be just as good or better, and borax, or borate of soda, should have the same effect. But the best thing of all is a certain simple preventive; this we have, I think, in the carbonate of soda, or

Common Baking Soda.

By washing the person in a solution of this before entering the "brush," or directly on returning, no injury will result from an exposure by the most sensitive. At least an old physician of 50 years' practice where these plants were common so informed me.

I have known men who through their whole lives dared not go into the woods in summer for fear of this plant, and others who were driven from comfortable homes by it. Therefore, I have undertaken the labor of this writing, for, as before said, any one may get cruelly poisoned by it when away off in the woods, far from medicaments, and if he knows all the simple remedies, he may save himself great suffering; for this reason every remedy and palliative should be yearly published.

The poison oak of this coast region is a very neat, pretty shrub, most abundant nearly everywhere. Its flowers are very rich in choice nectar for the honey bee; the honey from it is fine and wholesome, yet it poisons me and many others when riding along the road near the bushes.—*Cor. of Forest and Stream.*

SOMETHING ABOUT WRINKLES.—The general impression about wrinkles is that they are caused by worry, but the truth is that most of them come from laughing. To know how to laugh is just as important as to know when to do it. If you laugh with the sides of your face, the skin will work loose in time and wrinkles will form in exact accordance with the kind of laugh you have. The man who always wears a smirk will have a series of semi-circular wrinkles covering his cheeks. A gambler, who is accustomed to suppressing his feelings, generally has a deep line running from each side of his nose to the upper corner of his mouth, which in time extends to the chin, forming the shape of a half-moon. A cadaverous person is usually marked with two wrinkles, one on the jaw and the other under the eye, meeting at right angles at the cheek-bones. The scholar's wrinkles form on his brow, while the schemer's wrinkles come around his eyes and look like spokes of a wheel.

HYDROPHOBIA BACILLUS.—Dr. Richard Mollenhauer of Philadelphia thinks he has discovered the hydrophobia bacillus in a dog which he had rendered rabid by innoculation. The germ was a bacillus whose various growth-stages presented a uniform type. In its adult period it was usually found in chains, typically made up of four links, rarely of three, somewhat more frequently of two, and exceptionally of five links.

USEFUL INFORMATION.

RUBBER WHEELS FOR CASTERS are very desirable, as they are perfectly noiseless and do not wear the floors perceptibly, can be used on wood, brick and concrete floors with great saving. They are particularly adapted for all kinds of mill and warehouse work, and are greatly appreciated in hotels, banks and hospitals, where noise is troublesome. The great objection to these wheels arises from the fact that heretofore they have not been well made. One way in which they have been made consists in springing a ring of rubber on to a grooved wheel, but a movement of the wheel sideways would spring the rubber off as easily as it was put on. The other method consisted in vulcanizing the rubber on, but on being used the rubber would become loose from the wheel. A new method of manufacture has recently been patented under which they are composed of two compressing metallic disks, which are provided with a section of hub, peripheral flange, and an annular rim of vulcanized rubber, which is mounted on the shoulders of the disks and firmly compressed between their flanges by means of screws, making it easy to replace worn-out rubbers, and yet rendering it utterly impossible for the rubbers to slip off, as was the case with the old methods.

ANCIENT EGYPTIAN GLUE AND VENEERING.—Among the many occupations of the carpenter, that of veneering is noticed in the sculptures of Thebes, as early as the time of the third Thothmes, whom I suppose to be the Pharaoh of the Exodus, and the application of a piece of rare wood of a red color to a yellow plank of sycamore, or other ordinary kind, is clearly pointed out; and in order to show that the yellow wood is of inferior quality, the workman is represented to have fixed his adz carelessly in a block of the same color while engaged in applying them together. Near him are some of his tools, with a box or small chest, made of inlaid and veneered wood of various hues, and in the same part of the shop are two other men, one of whom is employed in grinding something with a stone on a slab, and the other is spreading glue with a brush. It might perhaps be conjectured that varnish was intended to be here represented, but the appearance of the pot on the fire, the piece of glue with its concave fracture, and the workman before mentioned applying the two pieces of wood together, satisfactorily decide the question, and attest the invention of glue 3300 years ago.—*J. G. Wilkinson.*

A NEW AND POSSIBLY VALUABLE INDUSTRY. Quite a number of our citizens, says the Point Arena *Record*, are financially interested in the enterprise which is being established down near the port. The new enterprise promises to be of considerable value to our town, inasmuch as if it comes up to the expectations of its projectors, over 2500 cords of wood will be utilized in the course of 12 months. Large furnaces are being built, over which will be a kind of oven into which the wood will be placed. Here it will undergo a roasting process, the result of which will be the carbonization of the wood, the product being a first-class grade of charcoal. The tar—which can be extracted from either fir or oak—being rather heavy, is drained off into a retort, while the gaseous vapors containing turpentine, acetic acid and alcohol are carried off through condensing worms into vats arranged for their reception. The charcoal made from oak is of the highest value, while the tar derived is worth about $1 90 per gallon. Oak tar is used as a base for quite a number of compounds, the principal of which is a preparation used in harness and leather blacking. In another week the success or failure of the enterprise will be known, and we can then predict its effect upon our community.

PORTLAND CEMENT IN SEA-WATER.—Concerning the influence of sea-water on Portland cement, M. E Candlot says: "The nature and quantity of the water used are of influence on the setting of cement. Sea-water, by forming calcium chloride and sulphate by double decomposition of the magnesium salts it contains with the lime compounds present in the cement, retards the setting. Neat cement gauged with sea-water is at first stronger than when fresh water is used, but retrogrades after some months. Cement, when made up into mortar by admixture with sand, shows no such tendency; the use of sea-water may delay its reaching its full strength, but this is attained after the lapse of a year. This fact applies particularly to finely ground samples."

CHEAP GAS FOR FUEL.—Boston is about to try the virtues of fuel gas. The Boston Gas Company, at the North End station, have a plant embodying the latest improvement in the production of water gas from the cheapest grade of fuel. They propose to utilize one set of distributing mains which belong to the old company, and if the public takes kindly to the idea are willing to spend some hundreds of thousands of dollars. If a man living on the line of this pipe is in a manufacturing business in which he wants to melt a little metal of any kind, drive a gas engine, run an occasional stove, or do a bit of occasional cooking, he can make the trial.

THE BUILDER.

Metallic Ceilings and Cornices, Etc.

The large use of zinc and sheet and plate iron and steel for architectural ornamentation and for taking the place of plaster and wood, is one of the notable facts in connection with the architectural work of the day, especially in this country and Australia. The *Building News*, in reference to this matter, says: Cornices, window-dressings, Mansard and other roofs, dormers and ornaments are largely formed of sheet metal, fixed upon brackets to the walls or otherwise secured to the structure. Unfortunately, we have no definite information as to the durability of this sort of architectural decoration, though, judging from English experience of metal-work and zinc applied externally, there is little promise of the permanence of these appliances. In Sydney zinc appears to be used for ornamental ceilings, and a ceiling of this kind on a rather large scale has been recently fixed in a hotel dining hall at Sydney, which, for richness of ornamentation and "beauty of design," is said to be unrivaled. The ceiling is divided into 15 deep and rich panels, "handsomely decorated and gilded." The chief advantages of a zinc ceiling are that it can be soon fixed without dirt and is a comparatively light material. Certainly its internal employment is more likely to be a success than its external application. The metal can be molded into panels or coffers and fixed up in large pieces, and the material can be decorated or gilded. Molded zinc cornices can be fixed *in situ*. The acoustical properties of the material is a point that has to be tested. One thing in its favor is its durability. We are not aware that metal ceilings have been employed in this country to any extent, though there are many substitutes for plaster. One question is the fixing of the sheets and the allowance to be made for expansion and contraction. To cover old ceilings, or to prevent the appearance of cracks, the metal ceiling is well adapted, as the sheets can be easily fixed, care being taken to prevent the unpleasant rattling of the sheets from vibration or shaking of the floor.

An iron trade journal of New York says: The great consumption of iron and steel in the past year can hardly be accounted for by the increased section of the new rails specified, or by the natural demands of a growing population. A little investigation will show how iron and steel are being made into varied forms, and taking the place of wood in almost all our living wants. A step in this direction, which has as yet attracted comparatively little notice, is the introduction of sheet metals to take the place of plaster and wood ceilings, as shown in the U. S. Army Mess Hall, at David's Island, New York harbor.

Heretofore the extended use of metal ceilings has been limited by the ornateness of design, high grade of skilled labor necessary to satisfactorily erect, and consequent cost. This difficulty was solved, and journeymen carpenters picked up in New Rochelle, N. Y., who had never before seen a metal ceiling, did the Government work referred to. An inspection of the alignment of the moldings shows them to be perfectly straight, and how admirably it works with only ordinary labor. To show that it is looked at in this light, a famous New York firm of architects has specified, among the other building materials of one of their great buildings, for 34,000 square feet of this ceiling. Judging from the success in the first year of its introduction, acres of the ceiling will be used, involving tons of sheet metal, adding another great and growing field for the output of our mills.

A NEW DOOR.—Worcester (Mass.) architects are much interested in a new door recently patented by a citizen of that city. The door is an adaptation of the principle of the roller-top desk and cover, and is described by the Worcester *Spy* as follows: The door consists of a series of slats, about 1½ inches wide and three-quarters of an inch thick, joined together by wooden spindles, one revolving within another. In the roller-top desk the slats are joined by ribbons of steel or canvas. When the door is opened it is wound up on a spiral drum at top and bottom, and all is inclosed within the door casing. An ordinary three-foot door winds up in a roll seven inches in diameter. A wire or cord or steel ribbon (as the case may be) runs from the outer edge of the door at top and bottom, and is wound upon a spiral drum in the casing opposite the side in which the door itself is wound up. A three-foot door occupies about 14 square feet in swinging, when there is nothing in the way, and most city people will consider that space worth saving.

THE FORM OF A ROOF often has much to do with the draft of a chimney. The flat roof offers no resistance to the passage of air, but as the pitch is increased the current is more and more disturbed, until with a high-pitched and many-gabled roof it is broken into innumerable eddies, some of which are sure to curl down and force the smoke and gases in the fire into the rooms below. Chimneys on such roofs should be built higher than ordinarily.

ARTIFICIAL WOOD.—One of the largest buildings in Northern Germany is a new Hamburg hotel, just completed, and built entirely of paper boards compressed to the hardness of wood. One rather unexpected advantage claimed in behalf of the new building material is the circumstance that, by being impregnated with certain chemical solutions, it can be made absolutely fire-proof. The same process of manufacture also secures it against the attacks of destructive insects, and might thus specially recommend it for use in certain river valleys of the American tropics. Wood eating ants have been known to demolish large frame buildings in less than a month.

ENGINEERING NOTES.

Railway Accidents.

Lack of actual uniformity in the gauge of railways which are nominally of standard gauge is believed by many to be the cause of many otherwise unexplained accidents. It is found by Poor's Manual for 1889, that of 548 different railway companies in the United States whose tracks are nominally of standard gauge, 129 use the gauge of four feet nine inches, while 419 out of the whole number have a gauge of four feet eight and a half inches. It is well known that it is a constant custom to run the same locomotive and trains on both these gauges. A play of three-fourths of an inch is given on the Pennsylvania Central, with its gauge of four feet nine inches. Now, the trains of that road are constantly being transferred to roads of four feet eight and a half gauge, where the wheels have a play of only one quarter of an inch. Is it not more than probable that a wheel will often mount the rail and not infrequently under conditions which will endanger a derailment?

A correspondent of the *Railway Age*, who has seen much service on railways, says: "I have found the proportion of cars from roads using four feet nine inches gauge that are 'off track' is far greater than that of other cars. Within the last few months I have been to two wrecks on the road and watched the replacing of three cars off track in the yard. The wreck was caused by car mounting the rail on a cross-over. It would not curve readily. This car and two of those off track in the yard were from a road using four feet nine inches gauge."

It is certainly unfortunate that exact uniformity of gauge does not exist in this country, because while no advantage can be seen in a variation of half an inch, the disadvantage and possible danger are evident. The subject demands most serious and earnest attention. If our railroad authorities cannot agree upon positive uniformity in a standard gauge, Congress should interfere and appoint an expert commission to decide upon the matter. It would seem that a careful investigation into accidents which occur upon the different gauges ought to determine just where the factor of greatest safety lies.

The subjoined information from Poor's Manual for last year may be interesting in this connection; a careful perusal discloses the following: Seven hundred corporations in the United States use 17 different gauges varying from five feet nine inches to two feet, 419 use four feet eight and a half inches, 128 use four feet nine inches, 121 use three feet and the remaining 32 scattering. According to mileage, 77 per cent use four feet eight and a half inches, 17 per cent use four feet nine inches, 5 per cent three feet and one per cent scattering.

THE LAKE CARRIER OF THE FUTURE.—The lake-carrier of the future is foreshadowed by the performance of the new McDougall steamer, the Colgate Hoyt, which, with a cargo of 2800 tons of iron ore, recently made an average of 13 miles an hour in running from Ashland to the Soo. With this almost phenomenal cargo her draught was only 15 feet; but it is not stated whether she was laden to her full carrying capacity. However that may be, it is certain that a wooden vessel of her size, or indeed one of any other construction not modeled on the same plan, could not by any manner of means load to within 25 per cent of her cargo mentioned without a much greater displacement. When it is considered that these carriers can be built at a cost of 25 per cent below that of ordinary wooden vessels, while their capacity is in like proportion greater, the prediction that they are destined to completely revolutionize the lake-carrying trade seems not at all unlikely to be realized in the very near future. —*Superior Leader.*

NAPHTHA ENGINES FOR STREET CARS.—Inventors are just now engaged in efforts to adapt the naphtha engine, which has proven so successful in steam launches, to locomotives for propelling street-cars. One such motor has been run six months, experimentally, at Elizabeth, N. J., and is said to have developed abundant power; it was found, however, that there were certain mechanical defects which it was necessary to overcome, but which were within easy reach of remedy. The locomotive developed a speed of 12 miles an hour. Another experiment, with a similar engine, is about to be undertaken in St. Louis. The cost of operating one of these engines for a day of 14 hours, covering a distance of 90 miles, is said to be only about $1 50. The cost of the same work with horses is not less than $5. If this experiment is correctly reported, important results may be expected from the new motor.

ASPHALTUM CONCRETE is proposed for a rock-fill dam. Experience has shown that even the most violent action of water has but little or no effect in wearing away asphaltum. Would it not greatly strengthen concrete as ordinarily used?

MINING AND SCIENTIFIC PRESS

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Metal Worker's Handy-Book—Henry Carey Baird & Co., Philadelphia.
Improved Ranch for Sale—E. M. Dewey, Porterville.
Assessment Notice—Gould & Curry Silver Mining Co.
Mining Engineer—Richard R. Hawkins, Sonora, Mexico.

☞ *See Advertising Columns.*

Passing Events.

Consulting our correspondence and exchanges that come to hand from the fields of active operations, the mining industry on this coast is being well prospered. The continuance of dry weather, while it proves detrimental to none, favors the river-bed miner, as the water-flow diminishes so long as the rains hold off, thereby increasing his opportunities for making a good season's work.

Judging from all we can learn, the output of our bullion-producing mines will be considerably larger this year than for several years past. That the product of copper, silver and lead will show an increment over that of last year admits of no doubt.

The manner in which former Comstock managements are being criticised by the mining press of the country is causing a general awakening on the subject of the abuses practiced by parties controlling leading Comstock properties; and the end is not yet.

The political pot, which at the time of our last issue was beginning to simmer, is now boiling fiercely, bringing much scum to the surface.

The Tariff on Imported Lead-Silver Ores.

Our national law-makers are confronted just now by a very difficult and perplexing problem inasmuch as its determination, whatever it may be, will work a hardship to parties engaged in different branches of mining, and also in less degree to certain other interests and industries. We have on the Pacific Coast and throughout the mineral regions of the interior a great many silver-bearing lodes that carry what are termed the "dry ores" only; that is, ores containing comparatively little or no lead. While these ores require to be reduced by smelting, they contain so little lead that a considerable quantity of that metal has to be added to them to insure their successful treatment by that method. If this needed addition of lead be supplied in the form of ores instead of the pure metal, a great economy is effected.

Now while we produce in this country a good deal of silver ore rich in lead—that is, ore carrying 18 per cent of lead and upward—we do not produce enough to meet the requirements of our smelters. In Mexico, however, this school of ores is produced abundantly and of good quality. Knowing this, our smelters have, during the past 10 or 15 years, put up many large furnaces in Colorado, Utah, New Mexico and other of our Pacific States and Territories, the proprietors depending largely on Mexico for their supply of this class of ores, some of them having for this reason located their establishments as near the Mexican line as practicable.

For the protection of such of our miners as owned deposits rich in lead, a law was several years ago enacted by Congress imposing a duty of 1½ cents per pound on all ores imported into this country in which the value of the lead was greater than the value of the silver they contained. Under the rulings of the Secretary of the Treasury during Mr. Cleveland's administration, this class of ore was admitted into this country duty-free. Subsequently this ruling was reversed and the above duty restored, the same being now as it has ever since been collected.

As will be seen, there has, out of this state of things, arisen two conflicting sets of interests—the one represented by the miners producing ores high in lead, who desire to have this duty retained, and the other by the smelters, who seek its abrogation. If under the circumstances Congress, and even public sentiment, is in something of a quandary on this subject, it is not to be wondered at, inasmuch as the arguments on both sides seem so evenly balanced.

If this class of ores is allowed to come in duty free, the miners will suffer. If they are to be subjected to this onerous duty the smelters claim that it will ruin their business, seriously reduce railroad traffic and materially enhance the price of lead to the consumer. Moreover, they contend that it will in the end greatly hurt the objecting miners themselves, as when the smelters are closed down these men will be without an available market for their ores.

If the interests of the greater number, the smelters, the railroad carriers and the consumers, are to govern the action of Congress, then the abolition of this duty becomes imperative. If, on the other hand, the interests of the minority are to be considered as paramount, and we are going to act consistently with our high-tariff professions, then it should be retained; nor in setting down this class of miners as being in the minority is it to be understood that their number is inconsiderable or that the territory they occupy is of limited extent. Far otherwise; they count up into the thousands and tens of thousands and are scattered over our mineral domain from British Columbia to Mexico. There is not a State or Territory within the limits of this vast domain but contains countless mines rich in lead, this metal constituting in many instances their element of largest value. New Mexico, Colorado and the northwestern tier of States are especially rich in argentiferous galenas.

Now, while each party to this controversy in arguing the question at issue does so from a purely selfish point of view, there are certain collateral considerations with which each seeks to strengthen its cause. If, say the miners' other interests and industries are entitled to be protected against foreign competition, so are ours. The cost of labor in this country is three times as dear as it is in Mexico, most of the necessaries of life being with us proportionately dear. How, then, without a protecting tariff on lead, can we compete with the Mexican producer for the market for this class of ores? Clearly we cannot, and there being open to us no other available market, we must necessarily give up mining these ores, which means the abandonment of properties in which our all is invested.

Carrying out his argument to its legitimate conclusions, the lead-producing miner proceeds to point out how much all our American industries have been indebted to protection against cheap foreign capital and labor for their prosperity and progress. In the absence of such protection we might, to be sure, have been the husbandmen of the world, producing beef and pork and growing the cereals, tobacco and cotton for nations abroad and receiving in exchange therefor their manufactured goods, at such prices as they might be pleased to name. Pursuing such policy, emigration to these shores would have been restricted, our industries, little diversified, would have been few and feeble, and our people poor. That we have become a nation of many pursuits, that we have grown powerful, populous and rich, is due largely if not mainly to this protective policy of our Government; why then in this particular instance seek to reverse this policy or why except the lead miner alone from its beneficent action?

In next week's issue of the PRESS we propose to follow up this subject, presenting the arguments adduced by the other side in support of the stand they have taken upon it.

Comstock Mine Management.

The *Engineering and Mining Journal* of Sept. 25th says:

Almost from the first, "Comstock mine management" has been a synonym for sharp practices, swindling of various kinds, and even bold and open robbery practiced upon the stockholders of the mines. To such a length has this gone that for many years the constant advice given by the *Engineering and Mining Journal* to its readers has been: "Leave Comstock shares alone; for whether the mines be rich or poor, the management being dishonest will absorb all the profits and divert the assessments. The unavoidable risks of mining investments are quite great enough without adding to them dishonest management."

The above coming from the leading representative mining journal of the East, is strong language and should bear good fruit in bringing about the long-needed reform in mine management on the Comstock lode. Comstock-mining officials in this city claim that everything in the mining and the milling of ore is conducted in an honest and straightforward manner. This assertion is open to challenge as long as the superintendents of the mines are not made to conform to the law in giving full details of the work done in the mine, ore found, extent and assay value, quantity of ore sent to mill, from what level, and its assay value; also the battery assay when milled. If this information is furnished by superintendents, then the officials in this city are at fault, for the reports are not posted or filed so stockholders can have access to them. The weekly letters are posted or filed, but they are made conspicuous by the absence of information such as the law calls for. It can be asserted without the fear of contradiction that if the mines are honestly worked, then the officials would not fear to give full and explicit information, such as the laws of this State demand shall be made of all work going on in the mines, together with the milling of ore.

The suit brought by M. W. Fox, chairman of the Executive Committee of the Mining Stock Association, against the directors of the Hale and Norcross Mining Company, charging misappropriation of funds, will, without doubt, throw considerable light on mine management as conducted on the Comstock lode. This suit will be watched with the keenest interest by all mining men, for it is conceded that a very thorough searching legal investigation will be made to substantiate the charges of the plaintiff, while the defendants will leave nothing undone to prove their innocence.

While this suit is in progress it is still in order to keep informed upon what is going on in the Comstock mines. The latest development is a report published in the Carson *Appeal* that the Douglass mill is working 100 tons of tailings and slimes daily, while the Morgan mill is working 200 tons daily. Few, if any, of the stockholders of the mines to which these tailings and slimes belong are aware that their property is being diverted into bullion and the bullion confiscated.

The Rock Point mill, which has a large quantity of rich tailings and slimes belonging to the Savage Mining Co., an incorporation of this State, is reported by the *Lyon County Times* to be making arrangements "to work the slimes and tailings that have been accumulating for years past. * * * A tramway has been built to facilitate the conveyance of the material to the mill from the reservoirs, and work will soon begin. These tailings," the *Times* continues, "are reported to be quite rich." It is clearly the duty of the Directors of the Savage Mining Co. to issue an injunction against the mill company who leased the Rock Point mill, and when the slimes and tailings are worked over to see that the bullion goes to the credit of the Savage Mining Company. Stockholders in the latter company should insist that their property be converted into bullion for themselves and not for the mill ring. The mill company was paid $7 per ton to reduce the Savage Company's ore to bullion and not to run a very large percentage (nearly one-half) of its value off into slimes and tailings. The former company should be forced to keep theirs and return all bullion to the latter company for stockholders' benefit.

The idea of a mill company returning only about 64 and 65 per cent of their battery assay to stockholders when Comstock ores can be and are worked, when desired, to 85 per cent! Now, as the difference between the mine assays and battery assays would cause a loss of at least 20 per cent more, the *Lyon County Times* is quite correct in saying that the slimes and tailings "are reported to be quite rich."

This slimes and tailings business is getting to be an outrage on stockholders in our mines. It is certainly time that directors of companies, presumed to be holding positions of trust for all stockholders, should be forced to do their duty. In this case their duty is clearly outlined. They have paid the man or men who contracted with them to work the Savage Mining Co.'s ore, $7 per ton. Their part of the contract has been fulfilled. It is their duty to see that *all* the bullion taken from the ore delivered to the mill under this contract (it matters not whether the contract be verbal or otherwise, in their official capacity as trustees for stockholders it is a contract) be returned to the Savage Mining Company to be shared in by all stockholders. If they refuse to do their duty, the directors of the said company are simply inviting legal inquiry which may end in something besides a mere action to recover property.

The Early and the Latter Rains.

The rain, which commenced on the 28th ult., was general throughout California, having been confined to that and the following day in some sections of the State, while in others it held on raining more or less for four or five days. While the precipitation in a few localities amounted to as much as 2½ inches, it did not generally exceed half an inch, being even less than that in most places. As a rule, this, like all premature and unseasonable rains in California, did more harm than good. It injured the grapes still on the vines, the unpicked hops and berries, and the raisins in process of curing some harm being also done to the dry grass and the sacked grain left uncovered or but partially protected. The only good that resulted from this rain was the laying of the dust, thereby rendering everything more cleanly, and travel more comfortable. But despite such small benefits nowhere did this rain meet with hearty welcome.

While some affect to see in these early rains the indices of an early or a late, a wet or a dry winter, as the case may be, they really seem to have no significance one way or the other. They have preceded some of our wettest just as they have preceded some of our driest winters.

Ever since our people came to occupy California we have been trying to obtain some clue by which to predict the character of our winters. We have consulted the Indian and studied the habits of the provident chipmunk and the sagacious woodpecker, but as yet to little purpose. During all these years we have been seeking a sign, but no sign has been given us save the sign of the prophet Jonah, and that has proved of hardly more use than the signal service, which presumes only to prognosticate the weather from day to day. We have need of something more far-seeing than this—something that will denote, if not the date of its advent at least in a general way the more notable meteorological features of the coming winter. When will arise the sage who will be able to supply this desideratum? What a boon would it be to the shiftless grain-grower and the slothful grape-picker, could they be duly advised as to the advent of these early and these latter rains!

Cheap and Reliable Information for the Mining Public.

In answer to note from "Old Subscriber," Sonora, we would say, much, if not all needed information on the subjects about which inquiry is made will be found in the Sixth Annual Report of the California State Mineralogist. On page 92 of that volume commences an illustrated article relative to the concentration of gold and silver ores on the Pacific Coast. On page 119, same volume, appears an article on the chlorination of auriferous sulphurets, this having been prepared by the State Mineralogist, Wm. Irelan, Jr.

Guided by the information and directions contained in these papers, the intelligent metallurgist and millman could not go far wrong in the matter of choosing and running a concentrator, nor yet in treating the concentrates by the Plattner process, as latterly improved and here recommended. While the State Mineralogist does not in this paper treat the subject of chlorination in an exhaustive way, he still gives such general instructions as meet the main difficulties, referring at the same time to the flow of the mountain streams has been phenomenal.

As a consequence, the big reservoirs in the Sierra, filled before the spring was half over, have so withstood the drain upon them, that none have since been entirely emptied. The most of them are, in fact, quite full at this writing, the water, in some instances, pouring over their dams and running to waste. Not, as in 1889, have either the placer or the vein miners suffered from want of water. Very few if any of the quartz-mills have, this year, for the above reason, been forced to suspend or even curtail operations, nor will this now happen to any of them. Their continuous running is assured, now that the shorter days and longer nights, with some rain in the mountains, have come. Even should the incoming year prove a dry one, the miners will not be likely to suffer seriously from water shortage till it is more than half over, if at all, there being still a good deal of last year's snow in the high Sierra.

The Broken Hill Mines.

The mines of the Broken Hill Proprietary Co. (Limited), Barren Ranges, New South Wales, are among the most extensive in the world. The operations of the company for the last half-year show a profit of £514,872 9s. 1d., and after deducting £45,594 8s. 7d. for depreciation on the whole of the various plants, dividends amounting to £464,000 have been paid, or equal to 11s. 7 1-5d. per 8s. share for the six months.

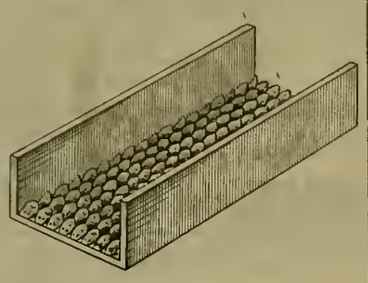
During the past six months there has been extracted from the mine 103,399 tons of ore. This has been treated in the ore-dressing plant and in the furnaces. The total quantity of ore smelted (net) has been 80,127 tons, yielding 3,814,486 ounces of silver and 15,400 tons of lead, or an average of 47.60 ounces of silver and 19 per cent of lead to the ton of ore. This has been mined and put into the surface bins at a cost of 17s. 8½d. per ton, including all dead-work and underground development work.

The mine employs altogether 2309 men, of which 1513 are in the mine itself. The furnace plant consists of 13 large furnaces with a weekly capacity of 4500 tons of ore. They have a large refinery as well as lixiviation works. The concentrating works handled 28,404 tons of low-grade lead ores in the last half-year. John Howell is the acting general manager, Wm. Harper mining manager, and H. H. Schlapp the metallurgist. The cuts given herewith show the plan of the Broken Hill district and the works of the Broken Hill Proprietary Co.

A Gold-Saving Device.

Charles Trafton of Yankee Jims, Placer Co., has recently patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a novel concentrating or gold-catching surface, which is shown in the accompanying cut.

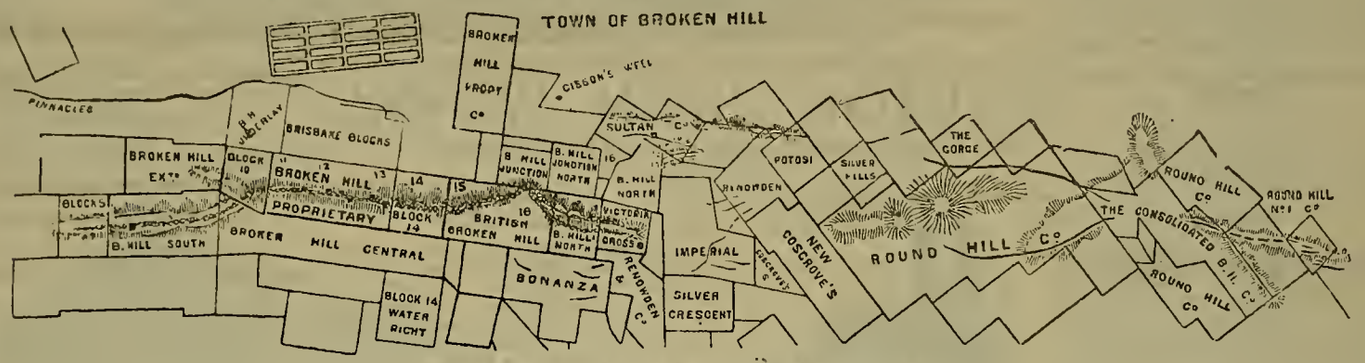
A frame or table is made suitable to fit in the bottom of a sluice, and over this frame or table are nailed or tacked the scales or cones of any tree of the order of coniferæ. For some work, as, for instance, for coarser material, the scales of the larger cones are used, such as are borne by the digger and the sugar pine. For lighter work the scales of smaller cones can be used, as of the spruce, and in some instances the scales of the cones of the fir and hemlock. These scales are closely set over the surface of the frame or table, somewhat after the manner of shingles, though not necessarily in the regular rows or lines of shingles, but in such sort as to fully cover the frame or table surface, the scales overlapping each other. They may be secured upon a perfectly plain surface, or upon a surface formed with inclines. In either case, on account of the peculiar shape of the scales, they do not lie flat and close upon one another, as do shingles, but their free points or ends are separated from the bodies of the scales which they overlap, and especially is this separation noticeable where the scales are set to break joints, as it were, in succeeding rows, because of the lateral convexity of the scale, a space being left between the points of the overlapping scales and the meeting edges of the underlying scales. This separation is more noticeable, however, in the form here shown, where the scales are attached to inclines. The surface thus provided is a very rough one, having deep interstices and spaces. The utility of the surface for the purpose intended lies in this fact to a great extent, as the heavier particles are caught in the interstices or spaces between the scales, which thus form riffles, while the lighter particles are washed off, it being understood that the table or frame is a washing-table, and water is to be used in connection with the ore. The water and ore flow over the surface in a direction against the raised or free ends of the scales.



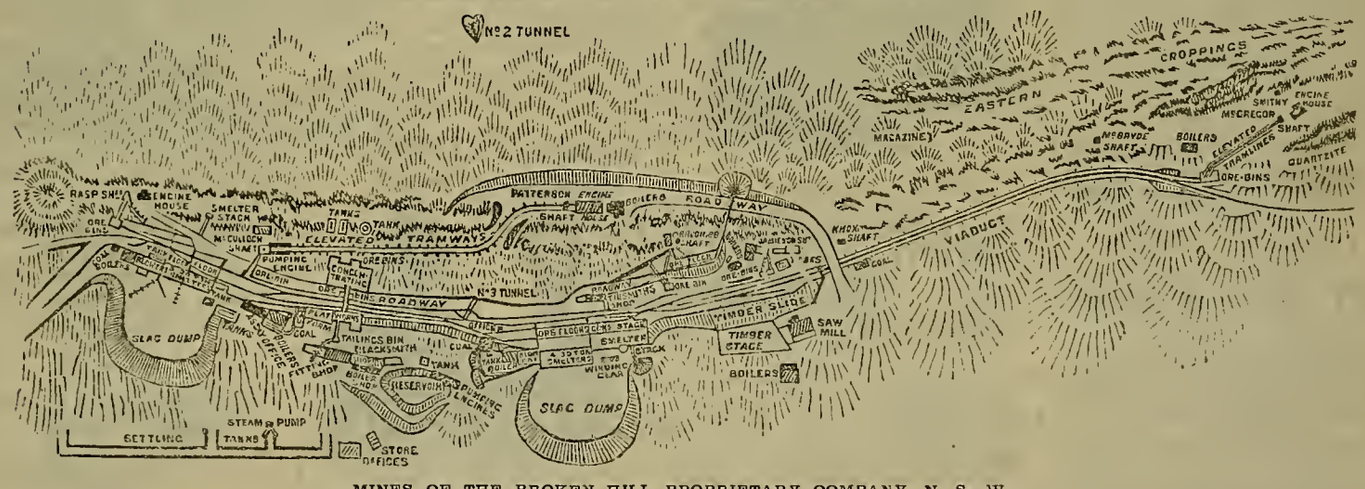
TRAFTON'S GOLD-SAVING DEVICE.

The table or frame which is here shown is intended to be one of a series of similar tables or frames to be placed in the sluice; but it is obvious that the same surface may be made within a properly or differently constructed frame having sides sufficiently high to form a channel for itself. The utility of this surface is not confined, however, to its roughness, but is due also to a peculiarity of the scale which develops itself after wear.

The upper or outer surface of the scale has a skin, which upon exposure or by reason of friction and wear breaks off in scaly bits, leaving underneath a fibrous kind of body, which serves excellently as a concentrating surface on account of its roughness. It is therefore a fact that after the scales have been in use for a time the skins peel off and wear away, leaving this



THE BROKEN HILL SILVER MINING DISTRICT. N. S. W.



MINES OF THE BROKEN HILL PROPRIETARY COMPANY, N. S. W.

more elaborate and what are considered authoritative works on the subject.

Pertinent to the matter in hand, it may be stated for the further information and guidance of the mining public, that in the series of volumes emanating from the Mining Bureau there will be found elaborate papers treating of almost every topic connected with the business of gold and silver mining. While the earlier issues of this series can no longer be obtained from the Mining Bureau, those of more recent date, being also those of the greatest practical value, can be had on application to that institution, the applicant paying postage, which, on the Reports of 1888 and 1889, amounts to 23 and 12 cents respectively.

The Water Prospect.

After a season of more abundant water supply than usual, the chances are that our miners will not suffer any water dearth for the remainder of this year, nor yet, perhaps, for another year to come. The bountiful precipitation of the past winter, snow on the higher mountains and rain at lower altitudes, insured such a water stock at the beginning of the dry season as we never before had. The ground, everywhere supersaturated, has retained throughout the summer more moisture than usual. The springs have ke full an

For Illegal Timber Cutting.—A dispatch from Tucson states that Daniel Ross, a millman of the Copper Queen Mining Co., has been arrested by U. S. Marshal Paul for cutting Government timber. His bail is fixed at $10,000. A civil suit will be commenced against Ross and the Copper Queen Co. for $90,000. It is alleged they have cut 3,000,000 feet of lumber.

The total wages paid to Wisconsin factory-employes in 1889 was $30,169,453—an increase of $3,169,299 over the year 1888.

Ground was broken at Sacramento Sept. 30th for the new Government building, to cost $300,000.

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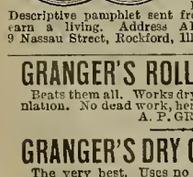

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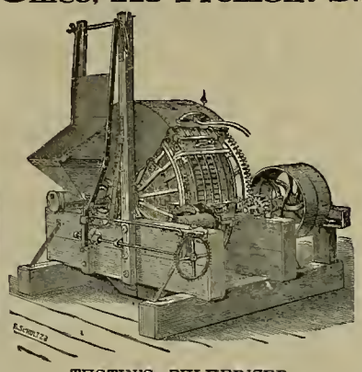

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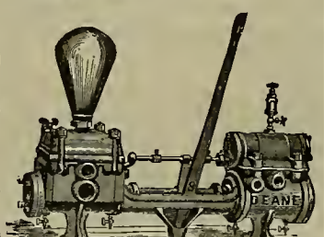

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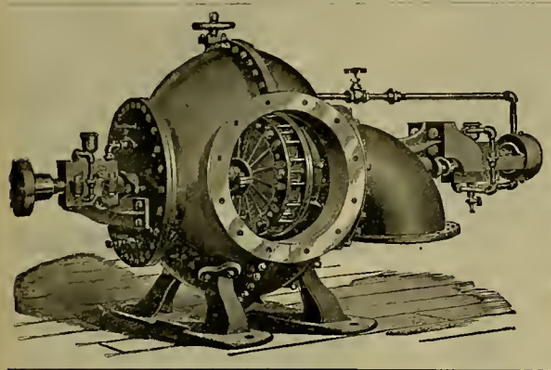


JAMES LEFFEL'S Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted to capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

JAMES LEFFEL & CO.,

Springfield, Ohio, or 110 Liberty St., New York.

FRASER & CHALMERS, General Agents, Chicago, Ill., and Denver, Col.

PARKE & LACY, General Agents, San Francisco, Cal.

RIX & FIRTH,

225 and 227 First St., San Francisco, Cal.

Compressed Air and Water Power Machinery.

KNIGHT'S WATER WHEEL,

For Mills, Pumping and Hoisting.

OVER 300 IN USE.

All estimates guaranteed. Send for Circular.

WINCHESTER HOUSE,

44 Third Street, - San Francisco, Cal.

This Fire-proof Brick Building is centrally located, in the healthiest part of the city, only a half block from the Grand and Palace Hotels, and close to all Steamboat and Railroad Offices.

Laundry Free for the use of Families.

HOT AND COLD BATHS FREE.

Terms, Board and Room, $1.00 per Day

And Upward.

Rooms with or without Board.

Free Coach to the House.

J. POOLEY.

Tioga District Mining Company,

Incorporated June 11, 1889. Capital Stock, $10,000,000.

BUY AND SELL

California Gold, Silver, Quicksilver, Copper and Lead Mines

OF ASCERTAINED VALUE.

Office, No. 13 PARROTT'S BUILDING, N. W. Corner of California and Montgomery Streets, SAN FRANCISCO, CAL.

WM. B. WIGHTMAN Pres. WM. H. V. CRONISE, Sec.

LIDGERWOOD MFG. CO.,

— MANUFACTURERS OF —

HOISTING ENGINES.

FOR MINING PURPOSES.

300 Styles and Sizes. Over 6500 in Use.

96 Liberty St., New York.
34 & 36 West Monroe St., Chicago.
197 to 203 Coogress St., Boston.

PARKE & LACY CO., Agts.

San Francisco, Cal.

Joseph M. Arthur, Portland, Oregon.

Send for Catalogue.

PERFECT PULLEYS

Firet Premium Awarded at Mechanics' Fair, 1884.

CLOT & MEESE,

Sole Licensed Manufacturers of the

MEDART PATENT WROUGHT RIM PULLEY

For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

SHAFTING, HANGERS AND APPURTENANCES.

SEND FOR CIRCULARS AND PRICE LIST.

PAT. OCT. 25, 1881.

Nos. 129 and 131 FREMONT STREET SAN FRANCISCO, CAL.

THOMAS PRICE & SON,

Assay Office, Chemical Laboratory,

BULLION ROOMS and ORE FLOORS,

524 Sacramento Street, San Francisco, Cal.

COIN RETURNS ON ALL BULLION DEPOSITS IN 24 HOURS.

WORKING TESTS OF ORES BY ALL PROCESSES.

SPECIAL ATTENTION PAID TO CONCENTRATION OF ORES.

Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

Metallurgy and Ores.

SELBY SMELTING and LEAD CO.,

416 Montgomery St., San Francisco.

GOLD AND SILVER REFINERY And Assay Office.

Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

—MANUFACTURERS OF—

BLUESTONE, LEAD PIPE, SHEET LEAD, SHOT, Etc., Etc.

ALSO MANUFACTURERS OF

Standard Shot-Gun Cartridges,

Under Chamberlin Patent.

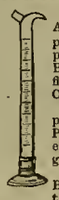
JOHN TAYLOR & CO.,

IMPORTERS AND DEALERS IN

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES,

ALSO CHEMICALS, AND PHYSICAL, SCHOOL AND CHEMICAL APPARATUS.

63 & 65 First St., cor. Mission, San Francisco.



We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.

M.C.Co BATTERSEA

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

Agents for the Morgan Crucible Co., Battersea, England. Also for E. G. Denniston's Silver Plated Amalgam Plates. The plates of this well-known manufacturer are thoroughly reliable, and full weight of Silver guaranteed. Orders taken at his lowest prices. Our Illustrated Catalogue and Assay Tables sent free on application.

JOHN TAYLOR & CO.

Nevada Metallurgical Works.

NO. 23 STEVENSON STREET,

Near First and Market Streets, S. F.

C. A. LUCKHARDT, Manager. ESTABLISHED 1869

Ores worked by any Process.

Ores Sampled.

Assaying in all its Branches.

Analyses of Ores, Minerals, Waters, etc.

Working Tests (practical) Made.

Plans and Specifications furnished for the most suitable Process for Working Ores.

Special attention paid to Examinations of Mines; Plans and Reports furnished.

C. A. LUCKHARDT & CO.,

(Formerly Huhn & Luckhardt,

Mining Engineers and Metallurgists

GREAT REDUCTION!

BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.

PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

Inventor and Manufacturer of the celebrated Slot Cut or burred and Slot Punched Screens.

Mining Screens a specialty, from No. 1 to 15 (fine).

Orders promptly attended to.

San Francisco Pioneer Screen Works,

231 & 233 First St., San Francisco, Cal.

JOHN W. QUICK, Proprietor.

WM. H. OONLY,

Lands, Mining and Commission,

124 SANSOME STREET,

Rooms 21 and 22,

Telephone No. 5057. SAN FRANCISCO.

TUBBS CORDAGE CO.

(A Corporation.)

Constantly on hand a full assortment of Manila Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.

Extra sizes and lengths made to order on short notice.

311 & 313 Front St., San Francisco, Cal.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 9, 1890.

General trade continues active in all lines. More is doing in mining machinery than for several years past. Money is growing easy with us under free remittances from the interior and only a fair demand. The East reports a growing ease in the money market, which reflects itself on ours.

There is complaint that the Treasury purchases of silver are not telegraphed. It is claimed that they are not made public. If this be so, the secrecy cannot he condemned too severely. A leading representative financier has just returned from New York, and informs us that the silver market is run by rings, but whether the Treasury is in it, no one appears to know.

MEXICAN DOLLARS—The demand is only fair. Quotations range from 88 to 89 cts.

SILVER—The Mint's counter rate is $1.12. The last telegraphic report of purchases at Washington was on Oct. 3, and is as follows: "The amount of silver offered the Treasury to-day was 957,000 ounces, and the amount purchased was 510,000 ounces, as follows: Forty thousand ounces, at $1.1345; 100,000, $1.1.37; 65,000, $1.1375; 50,000 $1.1380; 20,000, $1.1384; 180,000, $1.1385; 55,000 $1.1386." Public quotations posted by New York speculators are below Mint purchases for round parcles, and so is the price paid by the Mint or Department for small parcels. The Mint or Department, by having the counter rate low, plays into the hands of the speculators. A London cablegram, Oct. 7, says: "Ottomar Haupt prints in the London *Economist*, in a recent number, his estimate of the consumption of silver in the immediate future, which he thinks will be 4,500,000 kilos. He says silver is sure to rise sooner or later to 129."

QUICKSILVER—The market is strong at current quotations. The demand is fair. Receipts the past week aggregate 344 flasks.

LIME—Receipts the past week aggregate 3784 bbls., and exports by sea 75 bbls. to Honolulu. The demand continues fair. The buying appears to be largely from hand to mouth.

BORAX—Receipts the past week aggregate 200 ctls. The market is quiet but steady.

ANTIMONY—New York advices report the market gradually settling.

LEAD—The market is strong at higher quotations. Quite a consignment came to hand the past week from up north.

IRON—The market is steady. The consumption is increasing. Eastern advices report a strong market, while English advices report the market easy, principally due to the tight money market.

COPPER—The market is reported steady. The English market eased off some under realizing sales and a tight money market. The consumptive demand is reported to be quite heavy.

TIN—The market for pig abroad is lower and our market must follow. The action of Congress keeping pig tin on the free list, while increasing the duty on tin plate, is not calculated to encourage the tin-mining industry in this country. In tin plate from 97 to 98 per cent is still or iron plate and the other 3 or 2 per cent is tin, so that the latter gets very little protection.

COAL—Imports the past week aggregate as follows: Tacoma, 4700 tons; Seattle, 7095; Newcastle, N. S. W., 1046; Comax, 4300; Nanaimo, 1800; Departure Bay, 1214; Coos Bay, 1170; Swansea, 2311. Total, 22,590 tons. The quotations for several kinds are advanced. Large dealers report the market very strong and favorable to further advances in the near future. No vessel has left Australia for this port within a month past, while English cargoes are distant. We have the coast collieries to look to for winter supplies, and it is quite likely they will not scruple to get every cent they can. If prices are run up too high, it will encourage imports from other sources.

COKE—Imports the past week aggregate 294 tons from Swansea. The market is barely steady.

Coal.

TO LOAD—PER TON		SPOT FROM YARD—PER TON.	
Australian	$ 9 00@— —	Wellington	$10 00
Liverpool St'm.	8 50@— —	Greta	11 00
Scotch Splint.	8 50@ 9 00	Carbon Hill	7 50
Cardiff	8 50@— —	Nanaimo	10 00
Lehigh Lump.	16 50@17 00	Oilman	9 00
Cumberland hk	13 50@— —	Seattle	9 00
Egg, hard	16 00@— —	Coos Bay	9 00
CANADIAN ANTHRACITE COAL.		Cannel	12 00
Egg, ship side	$12 50	Egg, hard	16 00
Egg, yard	15 00	Cumberland, in sacks	17 00
Stove, yard	15 00	do, bulk	16 00
Nut, yard	16 00	Wallsend	10 00@10 50
		COKE.	
English, to load			$12 00@13 00
English, spot, in bulk			13 50@15 00

Eastern Metal Markets.

By Telegraph.

NEW YORK, October 3.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	51⅛	1 13	$17 00	$5 55	$24 00
Friday	51⅛	1 13	17 00	5 60	23 80
Saturday	51	1 12½	17 00	5 55	24 00
Monday	50⅝	1 11½	17 00	5 55	24 00
Tuesday	50	1 10½	17 00	6 75	23 00
Wednesday	50½	1 11	16 75	5 77½	23 00

NEW YORK, October 7.—Borax is not plenty; Cal fornia refined and powdered, 9½c Quicksilver is firm at 79@82c. Copper has moderate operations; Lake, 16¾@17c; Arizona, 15¾@16¾c; casting, 14½@14¾c. Pig Lead is scarce and quoted strong at $5 60@5.65. Several thousand tons of foreign for November and December delivery sold at $5.20@5.30. Since the above purchases, the European markets have advanced.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T.	LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alki Cons M Co	California	1	1	Aug 23	Oct 3	Oct 22	B B Keeler	Flood Building
Alpha Cons M Co	Nevada	5	25	Sept 16	Oct 22	Nov 12	C E Elliott	309 Montgomery st
A ta M Co	Nevada	39	10	Sept 1	Oct 7	Oct 29	L Osborn	309 Montgomery St
Best & Belcher M Co	Nevada	47	25	Aug 21	Sept 25	Oct 17	L Osborn	309 Montgomery St
Challenge Con M Co	Nevada	7	50	Sept 26	Oct 28	Nov 17	C L McCoy	331 Pine St
Goleta M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent	339 Pine St
Gray Eagle M Co	California	19	5	Aug 25	Sept 23	Oct 20	J M Buttington	303 California St
Gould & Curry S M Co	Nevada	65	30	Sept 16	Oct 21	Nov 13	A K Durbrow	309 Montgomery St
Hale & Norcross M Co	Nevada	96	50	Oct 7	Nov 12	Dec 3	A B Thompeon	3 9 Montgomery St
Humboldt M & M Co	Nevada	1	1	Aug 16	Sept 29	Oct 25	J C Ruddock	35 New Montgomery St
Kentuck M Co	Nevada	22	30	Aug 18	Sept 22	Oct 14	J W Pew	310 Pine St
Leigh G avel M Co	California	1	25	Sept 3	Oct 13	Nov 5	E E Fall	320 Pine St
Los Ba os Gravel M Co	California	12	5	Sept 3	Oct 9	Oct 31	J Morizio	325 Montgomery St
Mono G M Co	California	30	25	Sept 18	Oct 18	Dec 2	B L Burling	3.9 Montgomery St
Montecito M Co	Oaliforn a	1	10	Sept 16	Oct 27	Nov 24	D M Kent	339 Pine St
North Peer G & S M Co	Arizona	6	5	Oct 1	Nov 5	Nov 25	Henry Deae	309 Montgomery St
Peerless M Co	Arizona	15	15	Aug 14	Sept 23	Oct 14	A Waterman	309 Montgomery St
Sterling M Co	California	1	5	Sept 16	Oct 27	Nov 24	D M Kent	339 Pine St
Sug Belcher & Mides Cons Co	Nevada	7	25	Oct 7	Nov 10	Dec 1	E H Holmes	309 Montgomery St
Silv r King M Co	Arizona	4	30	Sept 29	Oct 28	Nov 18	Aug. Water an	325 Montgomery St
Weldon M Co	Arizona	3	10	Sept 3	Oct 9	Oct 30	A Waterman	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Cons Col & Va M Co	Nevada	A W Havens	309 Montgomery St	Annual	Oct 13
Eureka Cone M Co	Nevada	H P Bush	306 Pine St	Annual	O t 20
Exchecquer M Co	Nevada	C E Elliott	309 Montgomery St	Annual	Oct 20
May Flower G M Co	California	J Morizio	323 Montgomery St	Annual	Oct 20
Silver Nest Cone M Co		F R Bunker	328 Montgomery St	Annual	O t 21
Teresa M Co	Mexico	A Cheminant	328 Montgomery St	Annual	Oct 17
Valley View M Co		W J Garnett	303 Pine St	Annual	Oct 20

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Caledonia M O	Nevada	A S Cheminant	328 Montgomery St	08	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	April 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California	Grass Valley		2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Oct 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 18.		WEEK ENDING Sept. 25.		WEEK ENDING Oct. 2.		WEEK ENDING Oct. 9.	
Alpha	1.10	1.30	1.20	1.75	1.65	1.85	1.50	1.75
Alta	1.10	1.35	1.10	1.30	1.05	1.20	1.05	1.70
Andes	1.20	2.25	2.05	2.35	2.25	2.8	2.25	2.55
Belcher	3.15	3.50	3 30	3.40	3.25	3.40	3.15	3.40
Best & Belcher	3.20	3.55	3.25	*3.80	3.75	3.95	3 60	3.85
Bullion	2.70	2.85	2.75	2.85	2.80	2.95	2.75	3.70
Bodie Con	1.75	1.25	1.20	1.70	1.40	1.75	1.45	1.65
Bulwer	.30	....	....	.30	....	.25	....	....
Commonwealth	2.75	....	2.75	....	2.50	....	2.75	....
Con. Va. & Cal	4.70	4.9	4.80	4.85	4.75	4.90	4.75	4.90
Challenge	2.50	2.60	2.60	2.8	2.55	3.10	2.50	2.90
Chollar	3.15	3.40	3 25	3.40	3.20	3.40	3.15	3.75
Confidence	6.00	....	6.75	7.5	7.00	8.00	7.00	7.75
Con. Imperial	.35	.40	....	.45	.40	.45	.40	.45
Caledonia	.50	.70	.50	.55	.55	.60	.55	.60
Crown Point	2.70	3.10	2.90	3 10	2.75	3.00	2.70	2.90
Crocker	.25	.30	.30	....	.25	....	.30	....
Del Monte	1 10	....	1.00	....	....	....	.80	....
Eureka Con	....	....	4.25	....	4.25	....	4.25	....
Exchequer	1.00	1.20	1.05	1.25	1.20	1.30	1.15	1.50
Grand Prize	.35	....	.35	.40	.40	....	....	....
Gould & Curry	2.10	2.35	2 15	2.25	2.25	2.30	2.20	....
Hale & Norcross	2.20	2.80	2.35	2.45	2.35	2.45	2.20	2.40
Julia	.30	.35	.35	....	.35	....	.30	.33
Justice	1.40	1.60	1.45	1.55	1.50	1.60	1.40	1.55
Kentuck	1.35	1.60	1.70	*1.90	1.65	1.80	1.60	1.85
Lady Wash	.60	.75	.55	.75	.60	....	.60	....
Mono	.50	.55	.40	.70	.55	.60	.65	....
Mexican	3.15	3.30	3 20	3.30	3.35	3.60	3.40	3.50
Navajo	....	....	.45	.50	....	....	.30	....
North Belle Isle	....	....	1.15	1.25	1.10	....	1.00	1.05
Nev. Queen	.75	....	.85	.95	.90	....	.75	....
Occidental	1.35	*2.30	1.90	2.30	2.00	2.30	1.95	2.15
Ophir	4.85	5.0	4.90	5.25	5.00	5.25	5.00	5.25
Overman	2.20	2.45	2 20	2.3	2.15	2.30	2.25	2.45
Potosi	6.75	7.00	6.37	7.12	6 62½	7.00	6.75	7.62
Peerless	.10	.20	.25	.30	.30	....	.25	....
Peer	.25	.30	.25	....	.20	....	.20	.25
Savage	3.55	3.90	3.60	3.80	3.70	3 90	3.65	3.75
S. B. & M	1.35	1.75	1.55	1.65	1.50	1.70	1.50	1.60
Sierra Nevada	2.75	2.95	2.85	3.00	2.90	3.25	2.90	3.10
Silver Hill	.35	.45	.40	.45	.35	.40	.30	.35
Scorpion	.30	....	.30	....	.30	....	.25	....
Union Con	2.85	3.00	2.95	3.00	2.90	3.05	2.85	3.05
Utah	1.00	*1.25	1.10	1.20	1.10	1.25	1.10	1.20
Yellow Jacket	3.30	3.65	3.40	3.50	3.35	3.50	3.35	3.50

* Assessment de inquent.

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 9, 9:30 A.M.

200	Exchequer		1.40
30	Gould & Curry		2.20
30	Alpha Con	1.65	50 Grand Prize 40c
150	Alta	1.60	100 Kentuck 1 60
50	Andes	2.35	500 Lady Wash 60c
200	Belcher	3.25@3.30	100 Mexican 3.40
50	Bullion	3.40	50 Occidental 1.95
100	Caledonia	55c	300 Overman 2.35
200	Central	20c	50 Savage 3.55
250	Challenge Con	2.65@2.70	400 Silver Hill 30c
150	Chollar	3.50	200 West Comstock 60c
200	Crocker	30c	50 Yellow Jacket 3.40

San Francisco Metal Market.

WHOLESALE.

THURSDAY, October 9, 1890.

ANTIMONY	— @	21½
BORAX—Refined, in carload lots	8 @	—
Powdered " " "	8 @	—
Concentrated " " "	7½@	—
All grades jobbing at an advance.		
COPPER—		
Bolt	23 @	25
Sheathing	23 @	25
Ingot, jobbing	20 @	—
do, wholesale	18 @	19½
Fire Box Sheets	23 @	25
LEAD—Pig	6½@	7
Bar	6§@	—
Sheet	7½@	—
Pipe	7 @	—
Shot, discount 10% on 500 bags Drop, ₰ bag.	1 80 @	—
Buck, ₰ bag	2 00 @	—
Chilled, do	2 20 @	—
QUICKSILVER—By the flask	56 00 @	56 50
Flasks, new	@	—
Flasks, old	41 @	55
TINPLATE—B. V., steel grade, 14x20, to arrive	— @	—
B. V., steel grade, 14x20, spot	4 80 @	—
Charcoal, 14x20	6 75 @	7 00
do roofing, 14x20	6 00 @	—
do, 20x28	12 00 @	—
Pig tin, spot, ₰ lb., nominal	23½@	24½
CHROME IRON ORE, ₰ ton	10 00 @	—
IRON—Bar, base	3 @	3½
Norway, base	4½@	6½
STEEL—English, lb	16 @	20
Canton tool	9 @	9
Black Diamond tool	9 @	9
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—

	Spot.	To Load.
IRON—Glengarnock ton	34 00 @— —	30 @ —
Eglinton, ton	34 00 @— —	30 @ —
American Soft, No. 1, ton	— — @32 00	30 @ —
Oregon Pig, ton	— — @33 00	— @ —
Puget Sound	34 00 @— —	— @ —
Bar Iron (base price) ₰ lb	— @— —	— @ —
Clay Lane White	— — @28 00	28 @ —
Shotte, No. 1	34 00 @35 00	32½@ —
Langloan	34 00 @— —	30 @ —
Thorneliffe	34 00 @— —	30 @ —
Gartsherrie	34 00 @— —	30 @ —
Barrow	34 00 @— —	30 @ —
Thomas	33 00 @— —	— @ —
Cargofleet	30 00 @— —	26 @ —

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$17,335	$
Alpha	*2,874	
Andes	†19,000	
Bodie Con	16,093	
Benton Con	81,000	
Belcher	†25,523	
Belle Isle		9,650
Best & Belcher	*23,238	
Bulwer	5,212	
Bullion	8,660	
Challenge Con		*16,321
Caledonia	6,092	
Chollar		15,213
Con. Cal. & Virginia	**5,027	
Confidence		7,342
Con. Imperial	24,3?4	
Con. New York	5,645	
Commonwealth	††6,647	
Crocker	8,433	
Crown Point		1 938
Del Monte		10 922
East Sierra Nevada	2,681	
Eureka	21,575	
Exchequer	16,523	
Gould & Curry		*324
Grand Prize	†23,463	
Hale & Norcross		‡†26 046
Holmes		‡23,114
Independence	2,372	
Julia	5,292	
Justice	12,128	
Kentuck	*6,854	
Lady Washington	11,624	
Locomotive	1,669	
North Belle Isle		39 614
North Commonwealth		††31,778
Mexican	5,647	
Mono	*4,179	
Navajo		17,737
Nevada Queen		20,076
Occidental	*12,002	
Ophir	28,391	
Overman	†57,009	
Peer	6,939	
Peerless	*10,283	
Potosi		‡16,059
Savage		‡3,505
Scorpion	3,229	
Seg. Belcher & Mides		8,776
Silver Hill	5,337	
Sierra Nevada	26,164	
Silver King		*7,257
Standard	159	
St. Louis		
Syndicate	4,088	
Union Con	15 448	
Utah	14,739	
Weldon		*1,894

* Collecting assessment.
† Estimated.
‡ Bullion returns and mine expenses to be heard from.
** Unsold bullion valued at $233,376.17, with further shipments to be made. Monthly expenses of mine unpaid, and $114,395.69 due the Sutro Company for royalties.
†† About 44,000 ounces unsold bullion, with a monthly cleanup to come. The Company owes the North Commonwealth about $45,000.
‡‡ Besides royalty due the Sutro Tunnel Company on 33,840 tons of ore at $1 per ton. The mining expenses and bullion returns are not yet known.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others

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Assessment Notices.

GOULD & CURRY SILVER MINING Company.—Location of principal place of business, San Francisco, California; location of works, Virginia, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Trustees, held on the 16th day of September, 1890, an assessment (No. 65) of Thirty Cents (30c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 69 Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of October, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on THURSDAY, the 13th day of November, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Trustees.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69 Nevada Block, No. 309 Montgomery Street, San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Loca ion of works, Placer county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 19) levied on the 26th day of August, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Buffington, J M, Trustee	496	500	$ 30 00
Barrows, Albert	355	600	36 00
" "	357	271	16 26
" "	426	700	42 00
Bogart, O H, Trustee	473	214	12 84
" "	488	105	6 30
Bowers, D	379	20	1 20
"	404	500	30 00
Francis, H L, Trustee	286	300	18 00
" " "	444	1,600	9 00
Nash, H W	269	104	6 24
Roeckrans, H M	39	600	36 00
Stout, Mrs M E	170	500	30 00
" "	188	500	30 00
Stout, C S, Trustee	476	2,000	120 00
" " "	477	963	57 18
Searlee, W A, Trustee	518	1,000	60 00
Stetson, A M, Trustee	520	6,000	360 00
Taylor, J N, Trustee	532	1,040	62 40

And in accordance with law, and an order of the Board of Directors, made on the 25th day of August, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on MONDAY, the 20th day of October, 1890, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California street, San Francisco, California.

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DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, September 30, 1890. At a meeting of the Board of Directors of the abovenamed Company, held this day, a Dividend (No. 36) of One Dollar ($1.00) per share was declared, payable FRIDAY, October 10, 1890, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer Books close October 6, 1890, at 3 o'clock P. M.

F. B. PRITCHARD, Secretary pro tem.

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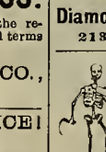

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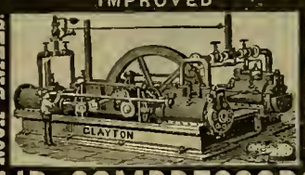

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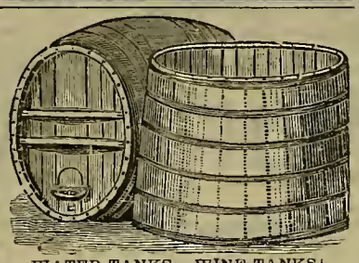

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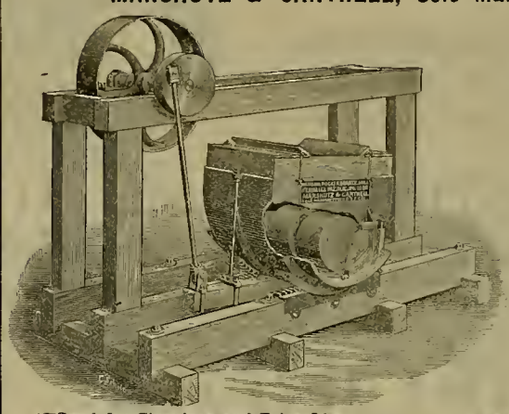

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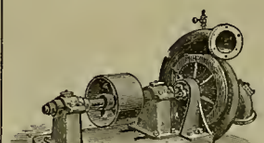

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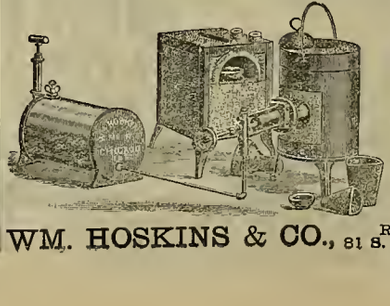

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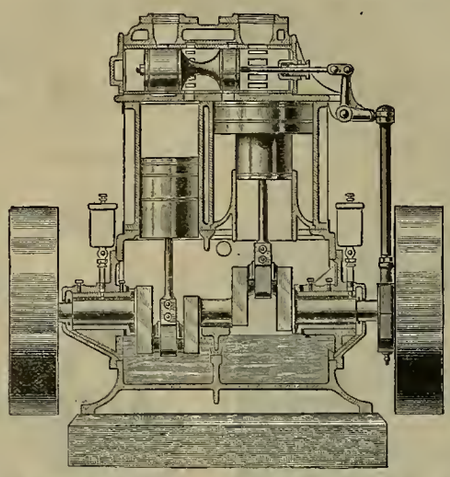

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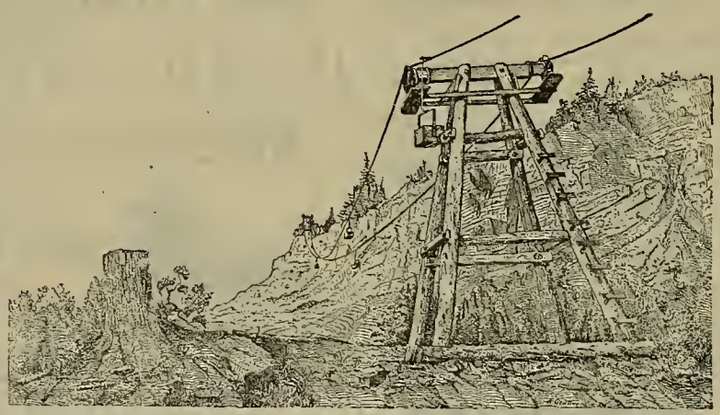

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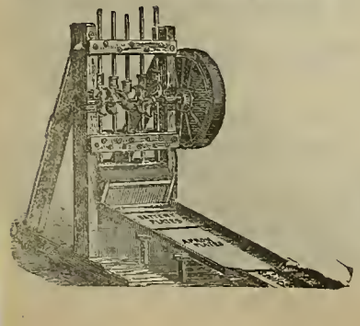

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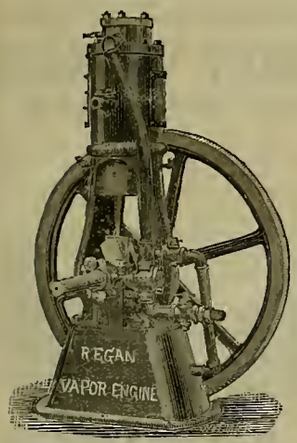

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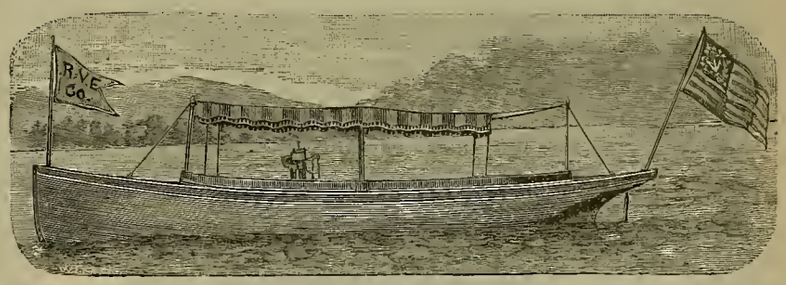
Yours truly, GEO. HAAS.



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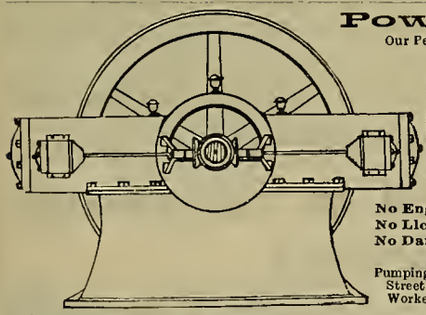

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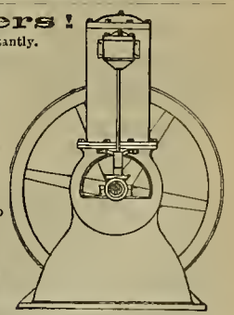

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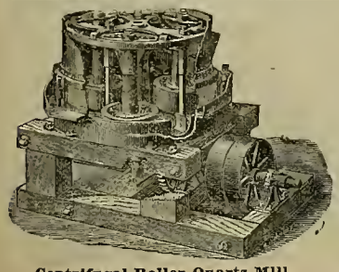

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Price of Improved Belt Frue Vanner, $825, f. o. b.
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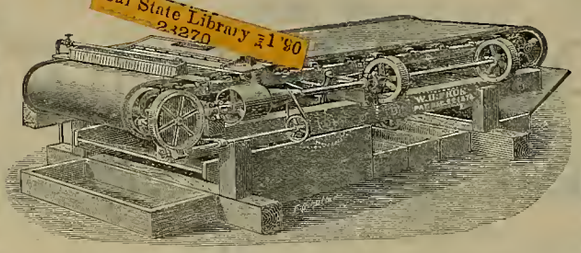


Protected by Patente December 22, 1874; September 2 1879; April 27, 1880; Maroh 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

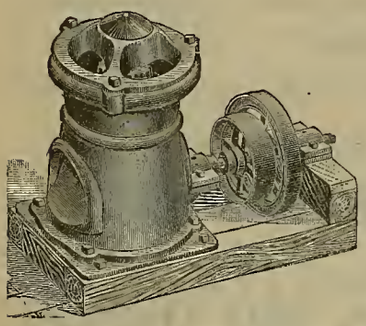
There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourssives of tbe superiority of your Vanners, as is evidenced by the fact of our having ordersd 20 more of your machines for immedlate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having bsen started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

GATES ORE AND ROCK BREAKER



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Guaranteed to do More Than Twice the Work of Any Other with the Same Cost in Wear.

The Gates Crusher having come so largely into use in all the Pacific Coast States, as well as in other mining regions, ample opportunity has been afforded for comparison, with the result that it has an admitted superiority for all such service. Wherever used in connection with the reduction of ores, the advantages have been so apparent, and the resulte so extraordinary, as to justify the belief that it will soon become a neceeeary part of every mill equipment, even to the discarding of all other styles of crushers now in use.

The most important feature of this Crusher is its capacity for fine work, it being poss.ble with any size machine to bring the product down to cubes that will pass a $\frac{5}{8}$" or $\frac{1}{2}$" ring. By this means, the output of a mill is increased from 25 to 30% without additional cost.

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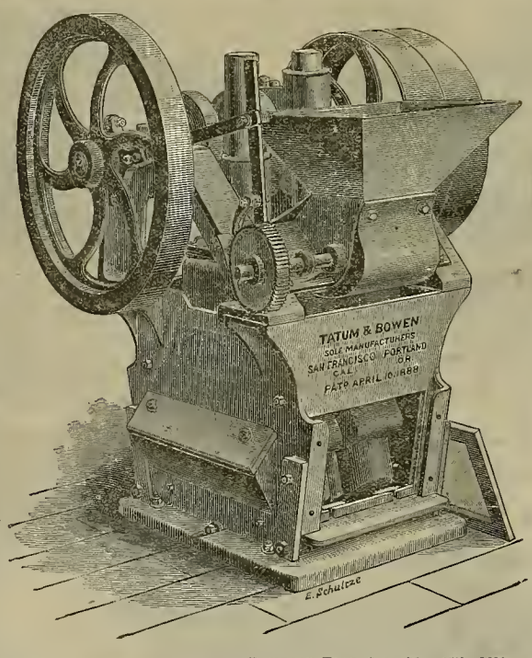

Attached to each Mill is an effective

Automatic Ore Feeder.

RAILROAD FLAT, CAL., May 15th, 1889.

MESSRS. TATUM & BOWEN, San Fraucisco—GENTLEMEN: I have had many inquiries in regard to the performance of your oscillating Stamp Quartz Mill, to all of which I have made substantially the following answer:

That it will crush and discharge through a No. 30 mesh wire screen, 6 tons of average quartz per 24 hours; that, compared with the common stamps, the power required to do the same amount of work is considerably less—the slipping motion of the stamps reducing the ore much faster than the drop alone can; that the discharge is good, and as to amalgamating and saving gold, my experience with it is that it is just about the same as the ordinary battery.

To the above I shall add that the new Automatic Feed attached is a perfect success. It can, in a moment and without stopping, be adjusted to feed just as "high" or "low" as desired, and can be depended upon to supply the stamps with ore exactly as they need it. This is important, as it saves feeding by hand, which cannot be considered at the present day, or the purchase of a high-priced feeder.

Considered as a convenient Mill for prospecting, or for a small mine, it fills the bill.

Yours truly, [Signed] JAS. S. REYNOLDS,
Supt. New York Mine, Railroad Flat.

The Mills as we mske them now are Far Superior to the one at tbe New York Mine.

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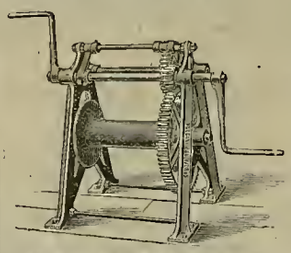

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 16.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, OCTOBER 18, 1890.

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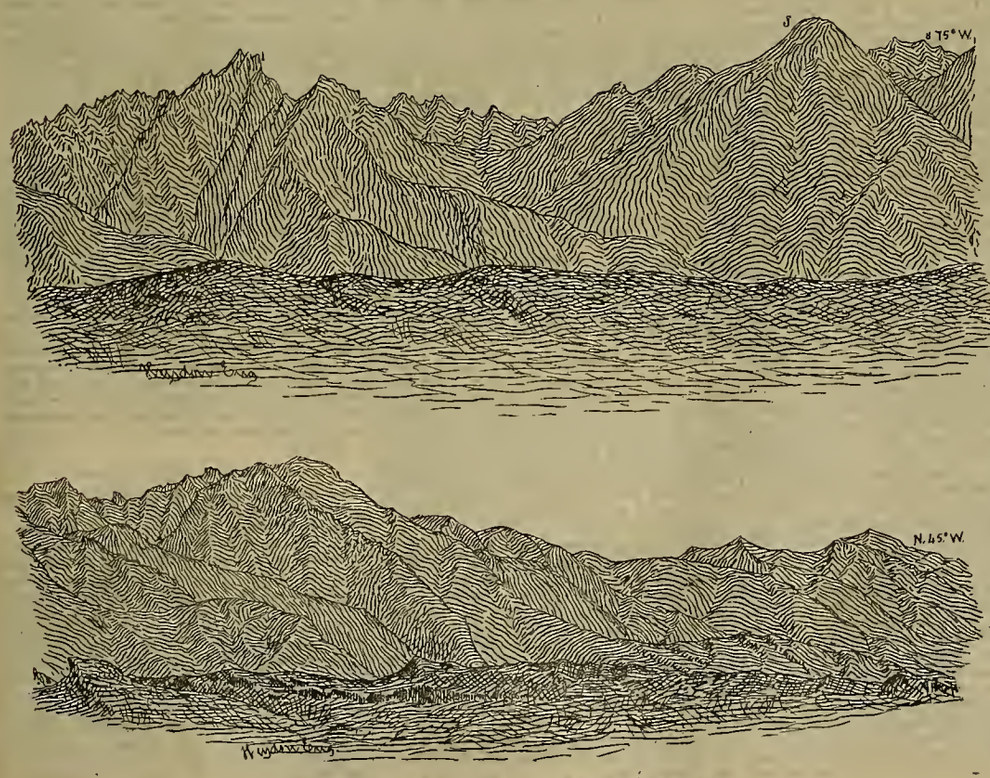
Farther North Along the "High Sierra."

We give herewith four additional cuts representing a portion of the "High Sierra" lying to the north of the section, in like manner illustrated in our issue of last week. While none of the peaks shown in this portion of the great California Cordillera are so high as some of those farther south, they are, nevertheless, very lofty, their altitudes varying from 12,000 to 14,000 feet above the level of the sea, their summits being from 8000 to 10,000 feet above the plain of Owen's valley, skirting this section of the Sierra on the east.

Returning to Mt. Whitney, shown in one of the cuts presented by us last week, it may be observed that a deeply serrated ridge extends southwest from that eminence for a distance of several miles, the sharp and splintered pinnacles standing along this ridge lifting themselves for 1000 feet or more above its crest. Some of these pinnacles run to a point so acute that it would seem as if a human being, could any ever reach their apex, would hardly find room to stand upon it. But this is a test of their standing capacity which none—not even the most adventurous and daring—will ever be able to make, so nearly do these pinnacles approach the perpendicular on every side. The gorges that separate these pointed and far uplifted spires are utterly impassable, there being not a spot along their sides where even the mountain sheep, the only dwellers among these crags, could gain a foothold. Originally these tall and slender spires consisted, no doubt, of great granitic shafts shoved up from below by volcanic, earthquake or other dynamic force, having afterward weathered into their present forms.

Turning and looking toward the southeast, there is seen another series of these spectral forms standing sentinel along the rocky rampart that stretches off in that direction. They do not look so frightfully steep as those on the left, and yet, perhaps seen from some other point of view, they might appear just as precipitous, these crested summits of the Sierra taking on sometimes a strangely different form when looked at from different points of the compass. Because of its serrated outline, this has sometimes been called the "Saw Tooth" range.



LONGITUDINAL SECTION OF THE HIGH SIERRA.

East of and nearly in front of Mt. Whitney stands a great eminence known as Lone Pine Peak because of the good view that can be had of it from that place. Viewed from the valley, this peak appears to be taller than Whitney itself, though it is not, in fact, so high by many hundred feet.

The Great Iron Producer of the Future.

As the United States has already become the largest consumer, so is it likely to become the largest producer of iron in the world. Edward Atkinson, in a paper recently prepared by him, remarks that, by reason of the proximity of the ores and coal in this country, as against the long haul of ores or their transportation from Spain and Africa to Great Britain, and the increasing depth and consequent heat of the coal mines there, it is probable that iron and steel can be made in this country as cheaply as in any other, notwithstanding the high wages we pay for labor. That writer is of the opinion that the consumption of iron and steel will for the next ten years fully tax the productive capacities of all iron-making countries to keep up with it, and hence that the prices of these commodities, while they may meantime undergo slight fluctuations, will be well maintained. He holds that of the present world's production of pig iron, amounting to 28,000,000 tons, this country makes now about 10,000,000 tons, an amount that will within the next ten years be increased to 44,000,000 tons.

DEEP SHAFTS.—It has generally been supposed on this coast that the deepest mining in the world has been done on the Comstock lode; but this is a mistake. In Bohemia a shaft has been put down to a depth of 3546 feet and another to a depth of 3509 feet. In Prussian Saxony there is a boring which has been carried downward to the depth of 5736 feet,

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Mad Mule and Other Mines.

EDITORS PRESS:—The so-called Mad Mule mine is situated about five miles north of Stella, and consists entirely of seam diggings. It was located some 20 years ago by Mr. Banghort, whose name for a long time it bore and who, working it for several years, made a fortune out of it. Finally, however, he gave it up, supposing it to be worked out. Other parties taking hold of it have since that time worked it with varying degrees of success. The present owners have been operating it for about a year and a half, and have pursued a course different from that followed by former owners, and in this conrse they have heen successful from the start, the mine being now a fine-paying property. The gold taken ont here is porons and light. There have been run in this grounds some eight or ten miles of tunnels. The best-paying pan of quartz taken out here yielded about $1400 worth of gold.

The Iler Brothers from Sacramento, who have been mining in this vicinity the past two years, have struck rich ore in the White Rock ground, near Iron Mountain district. They have run a tunnel some 200 feet and found a fine body of ore, which shows well in free gold and sulphurets. There are two other ledges on this claim on one of which they had sunk a shaft some 75 feet. This shaft has been full of water all summer, but the tunnel since run has drained it entirely. These ledges undoubtedly come together about 200 feet from the end of tunnel. These boys expect to have a mill in operation on this olaim some time next spring, going on and developing the lode meantime as fast as possible. J. D.

Shasta Co, Cal, Oct. 4, 1890.

Evading the Law.

EDITORS PRESS:—I wish to oall your attention to the loose manner in whioh our mining laws are being carried out, the way in which claims are located and held, practically defeating the intent of these laws.

There is, for example, one man in this county who has more than 60 claims located, and I am confident that he does not do $60 worth of work per annum on the entire number. Now if we had a law requiring each locator to make oath to his assessment work with one or more witnesses, it would stop parties who run around and locate the whole country and do nothing. True, they cannot lawfully hold such olaims, but few people care to try and rectify this abuse at the peril of having a lawsuit on their hands. Hence this unlawful practice is tolerated to the detriment of honest and legitimate mining. PROSPECTOR.

Shasta, Oct. 8, 1890.

A NEW TAMPING MATERIAL FOR BLASTING. Rossiter W. Raymond, in the New York *Engineering and Mining Journal*, has the following suggestion concerning the best material for tamping drill-holes, which ought to be of great interest to miners in the Kootenay Lake country. The variety of tamping materials employed in blasting is very large, and the subject has been discussed many times; but I do not remember having seen any mention of a material lately suggested to me by A. Mezger, a mining engineer of great experience and skill. I refer to jig tailings about one-quarter-inch in diameter of grains. Mr. Mezger says that this crushed and sized material works much better than sand, packing without any ramming, so as to make a good tamping even for black blasting powder. The application is very simple. Into holes inclining downward more than 40 degrees the tailings are charged with a funnel; for holes nearly level or inclined upward, they are filled in cartridges of one thickness of paper, which burst asunder when only slightly pressed with a tamper. The effect is always satisfactory; and as there is no pressure on the primer, this tamping material is especially to be recommended as diminishing danger in the use of nitro-glycerine and its compounds. Mines where concentration works are in operation can easily be provided with the material in abundance.

FOREIGN COIN VALUES.—A telegram received lately by Collector Phelps of the Customs Department from O. L. Spaulding, Assistant Secretary of the Treasury, is as follows: The department circular of the 1st of October proclaims values of foreign currencies as follows: Austrian florin, 42 cents; peso of Central American States, 85 cents; Shanghai tael, $1.25 6; Haikwan tael, $1 40; Mexican dollar, 92 3 cents; Russian rouble, 68 cents; Japanese yen, 91.7 cents, and other silver currencies in the same proportion. The circular will be forwarded as soon as printed.

SILVER LEAD MINES WORKED BEFORE CHRIST.—Talk about the silver-lead mines of this country lacking permanency bring to notice the famous silver-lead mine of Laurium in Attica, Greece, that was being worked over 400 years before Christ, and was then probably several hundred years old. It has been worked more or less ever since, yet it is still being mined so successfully as to pay regular dividends.

The Gold Belt of California.

Ancient River Channels and Gravel Deposits.

NUMBER IV.

[Written for the MINING AND SCIENTIFIC PRESS by STEPHEN BARTON of Kernville, Cal.]

The system of "dead river" channels which has made the term "blue gravel" so famous in the northern part of the State is thus seen to have extended uninterruptedly through the counties of El Dorado, Amador, Calaveras, Tuolumne and Mariposa. There are also large deposits of ancient gravel in Fresno county, but these, like those mentioned in Kern county, may belong to a more recent system.

While there are no lava-capped gravel ridges on the western slope, in Tulare and Kern counties evidence is not wanting that this region had its ancient system of rivers. East of a creek put down on the Government charts as Lime creek, but usually called Dry creek, and which puts into the Kaweah river, in Tulare county, and in Tp. 14, S. of 27 E., at an altitude of about 4000 feet above the sea, large numbers of water-worn pebbles are found on the points of the ridges, and the granite bedrock is soft and highly oxidized, as if once the bed of a stream. The same conditions are met with at Wagy Flat, west of the forks of Kern river, in Kern county, at an altitude of 3500 feet above the sea and 1000 feet above the great mountain-locked valley of the South Fork.

As I have before indicated, these ancient channels appear to have debouched upon the points of the ridges at an altitude of 2000 feet above the sea. Only a portion of them have been thoroughly tested for gold. The spurs of the ridges, marking the terminal point of the great flow which came down beneath the Emigrant Ridge east of Placerville, have been worked under the names of Coon Hill, Cedar Hill, Spanish Hill, Negro Hill and White Rock; but these workings are like the skirmish line in front of an army before the line of battle has been drawn. The great reserve of those placers is in the Emigrant Ridge. For 15 miles a high rimrock on the north of this channel intervenes before reaching the bluffs of the South Fork of the American river, and drainage in that direction would be costly. To the south, the channel of Weber creek is too shallow to offer successful drainage for more than a short distance. Hence the workings are liable to progress inch by inch from the Hangtown Creek base. This channel had its source somewhere in the vicinity of Little Silver lake, some 30 miles east of Placerville, and crossed the present line of the South Fork near a point formerly known as Bartletts Bridge.

I do not claim that these ancient gravel deposits were equally rich in gold throughout their whole length. On the other hand, the local characteristics in crystallization, when the gold is of the same value, speak of the supply as having come from lateral sources; but for miles above Placerville this channel must increase in wealth as the source of supply is approached.

A channel in all respects similar to this puts down to the south of the Middle Fork of the Cosumnes. Though I mined here for three years, I never saw a miner who could tell whence this channel took its source, and at its terminal point I suppose it is scarcely prospected to-day, though the placers of that locality are known to have drawn their supply of gold from it.

Still another channel of this kind puts down in the south of El Dorado county, by Indian Diggings, but this I have never followed for any great distance.

Probably as much wealth lies buried in the channel which puts down to Volcano, in Amador county, as there is in the Emigrant Ridge; but here again my explorations have been out short.

In the mining region of Calaveras county, the lava-capped hills are a marked feature of the landscape.

South of the North Fork of the Stanislaus, in Tuolumne county, there is a long stretch of cement covered channel, which, as I believe, remains without a single prospect-hole to-day. This channel must have crossed the present line of the Stanislaus somewhere in the direction of American Camp, and must have joined the flow from Murphys near Columbia.

The main Tuolumne river offers an instance of a stream adhering near to its original bed, notwithstanding a lava flow. The channel which passed to the Merced side of the ridge at Big Gap was evidently from the region now drained by the South and Middle Forks, and, as I have said, had no lava cap. But on the main river a flow of lava ran very nearly on the line of the present bed of the stream. West of Big Gap, it curved slightly to the south of the site of the modern channel, and there the lava cap may be seen for a distance of several miles. A rimrock separates this channel from the living river, and over this rimrock numerous springs are seen to rise from beneath the cement. At the point where this piece of a channel overlooks the Tuolumne, a tunnel was run into the pay gravel in 1869; but this gravel was so well cemented that it could not be washed, and the men threw up the claim in disgust, notwithstanding that they placed on exhibition at Oak Flat a piece of cement ten inches square, speckled over with gold on one side, like freckles on the human countenance. This gravel was of a dark blue, doubtless owing (as Mr. Talbott has well remarked) to the fact that the bedrock was of a serpentine slate.

For the present I will bid the auriferous gravels an adieu.

How to Avoid Strikes.

The extremely moderate and rational tone of the reply of Judge Dean, the president of the Cresson & Clearfield Coal and Coke Company, to the miners, dealing with the demands made by them upon the mine operators of District No. 2, embracing the Clearfield and Mountain regions, leads us to hope that a serious strike, affecting about 25,000 men, will be avoided. The whole style of this masterly address is a model for any employers of labor to adopt in dealing with a body of men who are possessed of common sense and capable of appreciating reason and fairness. In the preamble Judge Dean points out that the proposed scale of prices for mining agreed on by the miners of the district in convention makes demands which, if enforced at present selling prices of coal, would close the mines of the company he represents, and, in his belief, every mine in the district. He further gives the men credit for having in all probability acted without a knowledge of the facts as they exist on the side of the operators, and believes that if there had been a full consultation between fair, candid and intelligent men, operators and miners, prior to holding the convention, the action of the miners would have been different. This frank concession to the men on the part of the company of the right to make demands, and the appeal to them as fair, candid and intelligent men, was certainly the best way to insure fair consideration of the arguments of the mine operators. Then comes the plain *argumentum ad hominem* in the following words, which could certainly be understood by those interested:

"It seems to me our interests are so identified that it would be advantageous to us both to at least try to ascertain the facts on each side before taking such important steps affecting so seriously so many persons and such large investments of capital. We have invested over a million dollars in money; you have here the labor of more than 500 persons. We want to sell coal at a reasonable profit; you want to mine it at fair wages. If we do not pay fair wages you cannot afford to work for us and our mines must 'shut down.' If you demand unreasonably high wages we cannot afford to go on; the mines must 'shut down.' Neither of us makes anything by the shut-down; our capital lies idle; our improvements go to rack; you are idle for a longer or shorter time; lose time in hunting another place or other employment, besides expense of moving, with probably no larger returns for your work at the new place than you were receiving here, because wherever you may go you will not get more than fair wages; no operator can afford to pay more; if he attempts it, bankruptcy and a 'shut-down' soon follow. What is fair wages depends not on what you would like to get, or what we would like to pay, but on what, in view of the condition of the market and the nature of the competition we have to meet, we can afford to pay."

The demands of the miners were 26 in number, and through these Judge Dean goes carefully in his reply, conceding the point asked in some cases where fairness supported it, offering to make other changes requested if the miners could bring forward well-founded objections to the present method, and, in the case of those that affected the price of coal, tendering an inspection of the books of the company to prove to the satisfaction of the men that an advance in coal was incompatible with a continuance of operations.

The whole case is clearly summed up in these words: "The proposed scale seems to me to be based on a mistaken belief that this company is making large profits in which the miner does not share. You are receiving substantially fair wages in view of the condition of the coal business; this company at the same time has not earned and is not earning a fair profit on its large invested capital; nor do I believe any other operator in the district is in any better condition.

"Your right to organize and in convention adopt a scale advantageous to you, is not questioned; but a scale to be a fair one or a practicable one, must be based on existing conditions, on facts, and not alone on the interest of those who adopt it. In a business such as ours, which cannot be carried on by the operator without the miner, or by the miner without the operator, there never can be steady prosperity for both unless there be reciprocal good-will, fairness and candor."

While it may happen that in many cases the employer of labor, against whom a strike is threatened, has not so good a case on which to rest in reasoning with his men, we cannot too earnestly commend the style of argument adopted by Judge Dean, and we believe that were the demands of employes always met with a similar cool, judicial and painstaking exposition of the situation, many disastrous strikes would be avoided.—*Engineering and Mining Journal.*

IT IS ESTIMATED that in England one man in 500 gets a college education, and in America one in every 200.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XIV.

[Written for the PRESS by JAMES H. CROSSMAN.]

Granite Quarries.

Having completed our examination of that portion of San Bernardino county that lies south of the range and in a previous article briefly described, we turn northward and cross the San Bernardino range at an elevation of 4676 feet, through Cajon Pass. From the summit of this Pass the broad expanse of desert comes into view, but the elevation is not sufficient to enable us to note its distinctive features, hills and low mountain ranges obstructing the vision.

From the summit of Mount San Bernardino, at an elevation of 11,550 feet above the level of the sea, with the aid of a field-glass we obtain a view of that portion of the amphitheater enclosed on the arc of a circle whose chord from west to east measures 216 miles, its area 17,496 square miles. A radial line extended from the center of the chord due north would intersect the center of the arc on the boundary line between Inyo and San Bernardino counties. From our point of observation, 108 miles west, we reach the ocean a few miles north of Santa Monica in Los Angeles county. We turn our eyes to the Orient, and the San Bernardino range with its outlying spurs gradually loses its integrity and disappears altogether in the desert before reaching the Colorado river. Scanning the horizon from east to west beyond the exterior boundaries of the arc, Clark, Kingston and Telescope peaks are seen. Tehachipi mountain, as well as other ranges of lesser note, stands in bold relief against the horizon contracting the circle, and at a lesser radius Garlic, Pilot and Eagle peaks and Old Dad of the Providence range form prominent figures in the landscape. In the foreground a verdureless plain, basin-shaped depressures, beds of dried lakes and short uninterrupted ranges without order or system, meet the eye in striking contrast with the green fields and cultivated farms lying off to the south and west. Viewing the country in that and the opposite direction, the change has been magical. The lines are sharply drawn by the crest of the mountain—on the south fertility, on the north sterility. We are apparently on a foreign soil. We reach Hesperia, a boom town, situated on the northerly flank of the range, with her unfinished buildings which were erected during the flush times, when corner lots in paper towns sold by the front foot. This townsite is covered by a forest of cactus. The Yucca plant attains here a hight of from five to eight feet. The short, stubby arms extending from its trunk are armed with bayonet-shaped leaves, terminating in a hard, flinty barb so sharp that it readily pierces man or beast if they come in contact with it. These monstrosities of the vegetable kingdom stand apart, each by itself, presenting in their isolation the appearance of a planted orchard. In the vicinity, however, and on the same tract of land, a redeeming feature meets the eye like an oasis on the desert. The cacti have here been conquered and give place to a cultivated field of 100 acres or more, on which the vine and various semi-tropical fruits have been cultivated with success. Here the vine comes to full maturity in three years or less, bearing evidence of the wonderful fertility of this soil wherever water can be obtained for irrigating purposes. Water from the Mojave river has been brought in here through a ditch 11 miles long.

Silver Mountain Mining District.

Having descended into the valley proper, we cross over into the low mountain range known as Victor, described in another article of this series. This mountain presents a seemingly impenetrable granitic wall to further progress in that direction. On a closer inspection, however, a narrow gorge is seen on its easterly slope. Here at an elevation of 50 feet above its base, an excavation of considerable extent appears in the rocky cliff, this being the result of man's handiwork. Presently a sharp report is heard and a black column of smoke ascending from the spot tells the tale that a blast has been fired, and a huge mass of the rock has been torn from its bed and sent to topple over, workmen appearing presently from sheltered nooks to ascertain the effect of the shot. This is the site of

The St. John's Granite Quarry,

Situated in the Victor district at an elevation of 2763 feet above the level of the sea. This property is owned and operated by the Hesperia Land & Water Company of Los Angeles, who have opened quarries on both the east and west banks of the river. The western quarry presents exceptional facilities for both quarrying the rock and handling the stone, its face rising to a hight of 50 feet above the railroad track passing near it. The product of the mine can be moved by gravity and landed in the cars, but the stone is inferior to that taken out from the eastern quarry, where the principal work is at present being done. The formation is stratified, the strata being of considerable thickness and easily quarried. The deposit which pitches easterly at an angle of 14° has been opened up for a length of 700 feet by

a depth of 60 feet, with 200 feet of vertical backs.

Upon visiting the quarry which is situated half a mile northerly from the town of Victor we found that the result of the shot witnessed was to detach from its bed a block of granite measuring 60 feet in length and four feet in width by 20 feet in thickness, and which after being dressed will contain 48,000 cubic feet. There is here very little waste, even the chips being utilized. This result was produced from a 15-foot hole, using a 2½-inch bit, loaded with Santa Cruz powder. The block was estimated by the superintendent, P. H. Leach, to have a value when dressed and ready for the market of $20,000. Another block lay on the floor of the quarry, which was being worked up into 4x4 size, its measurements being 9x13 feet. The color of the granite here is a bluish-gray, free from iron or other impurities likely to cause discoloration on exposure to the atmosphere. It splits straight with a clean fracture and dresses smoothly and is susceptible of a good polish.

In strength this stone is much above the average, competent judges having pronounced it fully equal in strength to the best Massachusetts blocks, which measuring 4x4 feet, are sold in Los Angeles for $1.25 per cut foot. Railroad and freight charges from quarry to Los Angeles by the carload of 20 tons are $20. This property has been worked steadily for the past three years by a regular force of about 25 men.

Thence northerly we follow the Mojave river for a distance of two and a half miles and reach the

Shearer Granite Quarry,

Situated on the easterly bank of the Mojave, which has been well opened and is producing stone of good quality. The face of the excavation is 50 feet in hight by 75 feet in length. The stone is reported to be similar to that extracted from its neighbor and in the same formation. This granitic belt is about 3 miles in length by one in width from north to south. On its northerly extremity a belt of limestone comes in, bisecting it at nearly a right angle. The stone is traceable for about 12 miles in the direction of Highland mountain, where it breaks up and becomes scattered, forming on its southerly flank a disconnected body of considerable dimensions in which a quarry has been opened, known as the

Los Angelea Granite Quarry.

It is owned by a party in Indiana, but no work is now being done upon it. The stone is much mixed and stained in streaks and spots. Some beautiful specimens of onyx have been quarried here and are now lying at the works. The plant here, consisting of shop buildings, etc., is ample for requirements. The product has been hauled by freight teams to Victor, 12 miles distant, for railroad transportation to a market.

(To be Continued)

Decay of Boilers.

Many explosions of boilers would not have occurred if closer attention had been given to the deterioration of the boiler caused by the general or local decay of the material. A boiler when new may have a factor of safety of six; but it must be remembered that with the beginning of the life of a boiler, decay also begins, and that the original margin of safety is gradually reduced by the ever-progressing decay caused by corrosion; and if this decay is allowed to progress too far an explosion is sure to take place.

Corrosion does not always attack the surface of steel and iron plates in a uniform manner, hence the decay is more likely to be local than general. This difference in corrosion is probably due to the structural difference in the plates; they are not always perfectly homogeneous, being prevented from becoming so by the nature of the processes of manufacture.

For instance, the fibers of iron are welded together by squeezing, hammering and rolling, which sometimes allow the fibers to be separated by thin layers of impurities. The innumerable air and gas cells in steel ingots, more or less perfectly welded together by hammering and rolling, also prevent a perfect homogeneous structure; and it is fair to assume that the imperfect structure of the material is one of the causes of local corrosion; but in steam boilers there are other causes for local decay; for instance, a thin scale tends to protect the plates, but this scale often becomes detached in local places, leaving the clean iron exposed to corrosive action which rapidly progresses. Again, the fibers of the metal may have been loosened by bending, hammering, etc., all of which tend to accelerate corrosion.

Plates are affected in various ways by corrosion; frequently small cavities are formed in the plate, the depth varying from a shallow depression to an actual perforation of the plate. In some places the cavities lie far apart; in others they are close together, giving the plate a honeycombed appearance. This phenomenon is called pitting and may be caused by surface defects due to the intense local action of fatty acids, or other particles of corrosive substances; in some cases the cause of pitting is attributed to the galvanic action of particles of heterogeneous metals.

From the foregoing it appears that to prevent pitting good material only should enter into the construction of the boiler, and if pitting then occurs the water should then be analyzed, and, if necessary, changed; and greasy substances should not be allowed to enter into the boiler.

Frequently the corrosion forms deep furrows parallel and close to the seams; this phenomenon is called grooving or furrowing. In nearly every case this furrowing occurs under the water line, and in horizontal boilers with lap joints, the grooves are deepest along the horizontal seams. Probably the chief cause for furrowing is a chemical action, because it does not occur with all kinds of water, and it rarely occurs above the water line. But this chemical action is accelerated by a mechanical action which tends to change the form of the shell of the boiler, bending or springing the plates along the seams; but the bending of the plates may break off the incrustation, or even the outside scale of the plate itself, thus continuously exposing a fresh surface of the metal to the chemical action of the water.

The mechanical action may be due to the constantly occurring variation of the pressure, as steam is made or blown off, or it may be produced by the changes of temperature; and if this change of form goes on continually, though ever so slightly, along the same line, the mechanical action of itself must finally produce rupture.

Furrowing is often due to the carelessness of calking, by which the skin of the under plate is cut; careless workmen should not be permitted to use a calking tool.—*American Machinist.*

OUR JOURNAL IN ARIZONA.—The MINING AND SCIENTIFIC PRESS is being accorded gratifying recognition by those in the mining interest in the progressive Territory of Arizona. Our agent, H. G. Parsons, sent us 60 new names as one feature of his work in the mining camps of Arizona, besides securing renewals. We believe our work will please our new friends at the South, and we invite them to co-operate with us in advancing the mining industries of that important region.

A Visit to the Otay Watch Factory.

EDITORS PRESS:—Leaving San Diego over the National City & Otay railroad, in a few minutes we reach National City (which I will describe in a future letter), and continuing, cross the rich valley of the Sweetwater. Here the N. C. & O. R. R. branches, one line going to the famous Sweetwater dam, the other to Tia Juana. Taking the Tia Juana line, we find ourselves a mile farther or ten miles from San Diego at Chula Vista. This in a few years will be one of the finest suburban towns in Southern California. Here are 5000 acres divided into 5-acre villa sites. The price of lots and cost of building as required by terms of sale preclude the possibility of an undesirable class settling here. The town is laid out on a beautiful stretch of land in full view of ocean and mountains, and is already well dotted with homes. Passing on three miles, we come to Otay, the home of the Otay Watch Co. By courtesy of Mr. P. H. Wheeler, the superintendent, I had the pleasure of seeing a California watch in all stages of its makeup from the crude material in the material-room to the finished watch ticking the tick of Otay. I give the following notes of the works, which, while brief, may be of interest to the PRESS readers:

The Otay Watch Works are situated in the flourishing young village of Otay, San Diego county, Cal. The works commenced building machinery a little over a year ago, and turned out their first watches May 17, 1890. The watch was a success from the very start, and it is truthfully said that it is the handsomest watch made in America, and for time it has no equal, thus speaking volumes for the great Pacific Coast. The watches may be found in all jewelry stores in California, Oregon, Washington and Nevada. Many have been shipped to Yokohama, Japan. The factory is on a very successful basis, at this time carrying a surplus to its credit each month. It is said beyond question that this has been the most successful start that has ever been made in America. The factory is three stories high, built of fine red brick, 100 feet long, 40 feet wide, with office, boiler and engine rooms separate. Fine green lawns are laid out in front of main building, covered by growing tropical vegetation of all kinds.

THE OTAY WATCH FACTORY, OTAY, SAN DIEGO COUNTY.

The experts came from Eastern factories at Elgin, Ill.; Springfield, Ill.; Columbus, Ohio; Waltham, Mass. The factory is under the supervision of P. H. Wheeler, the superintendent, who is the originator and designer of the Otay watch and the patentee inventor of all the inventions in use by this company. The factory is equipped with the finest kind of modern machinery, and the departments are run by skilled experts of the highest order and most successful in the watch business in the United States.

The company at present employs over 90 people, and is constantly adding to the number. To Frank A. Kimball, general manager, may be given much of the credit of establishing the company on a solid basis. In its early days before the first wheel turned, the company having underestimated the size of the undertaking, scarcely knew whether to continue or to retire. In this predicament Mr. Kimball, with the same enterprise that has ever distinguished him, came forward and personally set the company on the solid footing it now enjoys.

Otay, Cal. J. B. H.

IT is reported that new veins of gold have been discovered in the vicinity of Wausau, Wis., where mining operations were first commenced.

The Late Dr. John Percy.

At the last anniversary of the London Geological Society, the president, W. T. Blanford, in noticing the recent deaths of members, spoke of Dr. Percy as follows:

John Percy was born at Nottingham on the 23d of April, 1817. He was the son of a solicitor, and after his early education studied medicine in Paris, where he appears to have derived his peculiar fondness for chemistry from the teachings of Gay-Lussac, Chevreul and Thenard. Subsequently he entered the University of Edinburgh and took the degree of M. D. in 1839, when only 21 years old. One of his fellow-students at Edinburgh was Edward Forbes, afterward, like Percy, one of the professors at the School of Mines.

His election to the Royal Society in 1846 was due to original experiments and researches in pathology, but meantime he was much engaged in metallurgical and chemical studies, and especially in investigations upon the properties of nickel and manganese. Some of his discoveries at this period were the foundation of metallurgical processes now in extensive use.

On the establishment of the Royal School of Mines in the Jermyn-Street Museum, 1851, Dr. Percy was elected as lecturer on metallurgy, a post which he held for 28 years.

His position, as by far the first metallurgical authority in the country, was now acknowledged on all sides, and the work to which, in addition to his lectures, he devoted the greater part of his time during the years that he held the professorship in Jermyn St., was the production of a great work on metallurgy in general. At the time when he undertook this, there was no comprehensive work on the subject in the English language. The value of the information may be inferred from the fact that translations of all the volumes as they appeared, were published both in French and German. Rarely in any country, probably never in England, was a more brilliant and gifted staff brought together for teaching purposes than those who, under the late Sir H. de la Beche, established a mining school in London, 1851.

Among the whole of them, as I can testify from memory, in the unanimous opinion of the students, Dr. Percy's lectures on metallurgy and Sir W. W. Smyth's on mining were pre-eminent for clearness, command of the subject and the power of conveying information from the master to the learner.

At present there is scarcely a scientific metallurgist or assayer who has made himself known in this country by his work, who has not passed through Percy's laboratory and learned science from his teaching.

For Postal Telegraphy.

Within the week, Postmaster-General Wanamaker has made public a letter which he lately addressed to the House Committee on Post-offices, in favor of his plan for a limited postal telegraph. He says, among other things:

"I am more than ever convinced of the wisdom and practicability of restoring the telegraph to the postal service and of making it what it was originally intended to be—part of the postal system. I say this after closely studying the arguments against the bill made so vigorously by the great telegraph company which is now its only visible opponent. There is a deep and far-reaching conviction among the people that the telegraph service is by right part of the postal service. The measure is to give the country a vast enlargement of the postal system and to bring home to the people the cheap use of one of the most powerful agencies of modern commerce and civilization. * *

"It has been argued by learned lawyers for a score of years that a Government telegraph is unconstitutional....The courts of highest appeal have settled this question. Congress settled it in advance of judicial action by making the United States the owner and the Postoffice Department the manager of the first line of wire constructed for commercial and public use. The old Government telegraph schemes were constitutional. What shall be said, then, of the limited postal telegraph plan which I have been criticised for bringing forward? The Attorney-General for the Department has assured me that the conclusion that the scheme is constitutional cannot be resisted."

In concluding, the Postmaster-General says he has always invited the most rigid scrutiny and criticism of the measure. "It is not the proposition to take money from the treasury or employ additional civil servants; it is not a proposition to put any power whatever in the hands of the Government which is not at present greater and more dangerous where it is. It is the proposition simply to dovetail together two great machines so that one shall do business equitably and by that means make more money, which shall willingly be accorded to it by the people; the other to utilize its present skilled and faithful energy to help supply the people with still better means of communication, furnished still more cheaply.

"If others speak out for the telegraph stockholders, some one must stand out for the people in the interest of the cheaper telegraphy that they want. I believe it belongs to this Department to take this stand, and I propose intelligently and persistently to keep this subject before you, in the strong confidence that it will not be long before your committee will take steps to give the people the relief prayed for."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SOUTH SPRING HILL.—*Register*, Oct. 11: At this mine they are running a drift from the Talisman property to connect with the works at the South Spring Hill. They have 200 feet farther to go, with ore at both ends. When connection is made, the ventilation will be greatly improved, thereby facilitating materially operations. Supt. Tregloan has got in all the winter supplies of wood, timbers, and other material, and is prepared for an early winter should such be in store.

MISCELLANEOUS.—Nothing new has transpired at the Amador gold mine during the week. The pumps are being taken out, and everything points to the shutting down of the property for a time—maybe for a long time. A number of miners were laid off temporarily at the Zeile this week, on account of needed repairs to the shaft, which will take several weeks to complete. Parties are expected from below to look at the Bright claim, with a view of purchasing it. The Sutter Creek and Rose mines paid off this week.

El Dorado.

GRIZZLY FLAT.—Cor. *Mountain Democrat*, Oct. 11: We had two days rain last week, just enough to lay the dust and to remind us that the rainy season is approaching. The rain was looked for and prayed for by the miners in early days, and they would work out in it all day without a coat, and some of them without gum boots, and then go home to a dinner of bacon and beans with black coffee and slap-jacks on the side—all happy. But it is different of late years. Let it commence to rain now, and there is a foot-race to see who will get to the house first. I made a mistake last week when I said the Oak mine was on the south brink of the Cosumnes river. It is on the northwest side, and from what I can learn is running all the time on good rock. Tom Daly and Millgate are in our camp again, and will soon begin work on their quartz mine. I understand the Parker Bros. have a 10-stamp mill on their claim, and are taking out good rock. John McClane is getting out timber, ready for work in his gravel claim. There are no idle men to be found in and around Grizzly Flat at present.

Inyo.

SYLVANIA.—Cor. *Register*, Oct. 11: Some 16 miners are employed in the Liberal and Climax mines, and work is being favorably prosecuted under the supervision of Foreman Cyrus Grant. An ore chute is being erected at the Liberal shaft, from which teams are to load for the furnace. It will hold 50 tons of ore. The furnace is nearly completed, and Machinists George Thorpe and Frank Higgs are getting the blower, boiler and engine ready, setting pumps and laying the required steam and water-pipes. Whether smelting will commence as soon as the furnace is ready is more than I know. A heavy rain has been falling here lately; no snow as yet in this immediate vicinity, but the White mountains to the west are clothed in a heavy mantle of white. Since my last letter was written, some rather unexpected changes have been made in the affairs of the Sylvania Mining Co. Mr. Sandhorn of San Francisco, a member of the present company, arrived here on the morning of Sept. 30th, having traveled all night. The day was occupied by Mr. Sandhorn, in company with Supt. File and Secretary Starrett, in making a careful examination of the mines and other property of the company, including the 800-ton pile of ore on the dump of the Liberal shaft, which proves to contain a much larger amount of waste than ore. After a thorough investigation, and a long talk over the condition of affairs, it seems to have been deemed inexpedient to continue any work not directly connected with the development of the mines. Therefore all work on the furnace, engine and boilers, the building over them and all outside work was the next day indefinitely postponed, and the services of some 20 men dispensed with. Work will be continued in the mines with the usual number of men prospecting, and about 25 men will be kept employed by the company during the coming winter. The date for pay-day having been so often set and just as often passed, the miners refused to go to work on the 1st instant, as they wanted to know something about the next date for pay-day. Since that morning, checks payable on 30 days' sight have been issued to all who are willing to take them or can make a satisfactory settlement. Several of the miners took the checks, quit work and left town. A few others are still here waiting to try to get sight checks. This is an injustice to men who are out of money, have been discharged and are compelled to go elsewhere to seek employment, and there has been a good deal of swearing over the matter. Mr. Starrett intends to have a regular pay-day established and then the men will be better satisfied.

BISHOP.—A carload of fine marble from the Inyo quarry passed up the road Saturday. These shipments are more numerous than the papers have opportunities to record.

FROM DARWIN.—Additions to the number of men at work in the Defiance mine, Darwin, are being made. The prospects for big yields from the mine are said to be exceedingly good.

Nevada.

TEMPORARILY IDLE.—*Tidings*, Oct. 13: The underground employes of the Omaha and Lone Jack are enjoying a brief period of enforced idleness while the shieves, etc., are being arranged to enable the handling of cars in the new landing, which is 40 feet higher than the old landing, thus insuring adequate dumping facilities. The mine is looking well and profitable operations, extending over many years, are anticipated.

GOLD HILL.—Pending the determination of the power question, no effort is being made to pump out the lower levels of the Gold Hill. Water-power is to be adopted, but it is not settled that it will be this fall. The 300-level drifts are being driven ahead, and in all 15 men are employed.

AN OLD-TIME MINE.—*Transcript*, Oct. 14: Work is steadily being pushed ahead on the Holbrooke and Harrington mine, situated on Randolph Flat, about three miles below Grass Valley. The shaft is now down about 110 feet and in hard cement. It is expected to strike the channel at the depth of 170 or 180 feet. Two shifts of two men each are doing the underground work, and are progressing favorably considering the nature of the ground.

STRIKE IN THE MERRIFIELD.—The Champion Mining Co., who are running a tunnel to strike the ledge in the Merrifield ground, on Friday night encountered a stringer six inches or more in width containing fine-looking ore. It is a feeder to the main ledge, which they expect to strike in a short time. The indications are favorable for getting it good when they do reach the ledge. Dr. E. F. Liebrick, J. S. Schuster, Peter Tautphaus, Henry Steinegger and E. S. Beedle, who are stockholders of the company, came up from San Francisco Sunday night to inspect the mine.

WASHINGTON DISTRICT.—*Herald*, Oct. 13: Mining operations on the Yuba river in Washington township, and on the ridge this side, have been going on quietly but satisfactorily this season. The gravel channels on the ridge are being prospected energetically, and we believe the result will show successfully. The operations of the Manzanita and Harmony are well known here. The mine back of the Central House, owned by a Sacramento company, and superintended by Mr. Mayberry, have been extending their tunnel until they feel confident they are under the channel. They will to-day commence an upraise. Worthley & Co. have done assessment work on their claims north of the Central House. The Centennial Co. are doing development work, and will soon have room for the employment of more men. The Centennial has a tunnel in over 700 feet and is pushing it ahead as rapidly as possible. The Huntington mill on the Red Point mine, this side of Washington, is in place and the building is nearly completed. The Washington mine at Ormonde is running full-banded and the mill kept running steadily. The quality of the rock recently crushed by George G. Allan at the Nevada county mill proves what may be expected for the next six months' work. Jack Rodda is working on his claim just above the Washington, and has C. E. Clinch of Grass Valley and another partner in with him. He has struck a very large ledge which shows free gold liberally. The Yuba and Eagle Bird mines are turning out monthly dividends as usual, and will for several years more on ore now in sight. The Governor Morton mine is showing up well. The lower tunnel is now running on a two-foot ledge which shows well in free gold and carries sulphurets that are very rich. The Blue Jay mine is being worked and good rock is being taken out. The owners are desirous of selling the property, as all of them are not in a condition to prosecute extensive work. It is one of the best prospects on the river. There are several other operations going on up in that section. In fact, Washington township is keeping up its record as a gold-producer, and promises to outstrip itself in the near future.

WATER OUT.—*Transcript*, Oct. 11: Capt. Jas. Hammill, who has charge of the Coe mine, informs us that the water is entirely out of the mine, and that in a very few days some of the members of the Board of Directors are expected here and will give the mine a thorough examination. It is believed by many that the Coe is an extension of the old Eureka mine.

Plumas.

THE OLD RIVER CHANNELS.—*National*, Oct. 11: Despite our considerable other resources it may be well to remember that mining in this section is our sole dependence, as it has been for all who were here before us. A few of the old class of '49 miners are still here, and cling with melancholy fondness to the same old bars, the same gulches, rivers and creeks, that in the days of old yielded up to the touch of man wealth that is now beyond the dreams of the most imaginative enthusiast. Fortunes were made in spaces of time that now must be recorded in years and life spans. Gold in those days was easily found and easily gotten. The erosion of centuries had broken through the mighty vaults of water and tapped the golden streams which flowed, and flow unceasingly to this day, and will continue to flow forth their yellow grains, until the mountains are worn away and plains take their places. It is now into these strongholds of wealth, or nature's treasure-boxes, that man must look for gold. He cannot await another epoch in nature's calendar to again glean from the surface a secondary deposit, but he must go to the fountain heads from whence these accumulations came, and there dig from the mother vein, metal in its virgin purity. Quartz, however, is not the only prolific source. The extinct river channels with their deposits of gravel, offer next to the quartz veins, a source to which the prospector may turn with almost equal assurance that by a diligent, intelligent march his labors will be rewarded. The active rivers of the present day have yielded from their beds great wealth. Hence it is altogether without reason to believe that the old channels which have ceased to flow will likewise yield a gathered treasure equal to our live rivers of the present time. This has been proven in very many instances. Great mines have been discovered in old channels, and still hundreds exist in these mountains, plainly in sight, that have not been touched by the hand of man, though it is safe to predict that before many years shall pass these will be opened and their beds explored. There is a dearth of prospectors at the present time. The old-time pick, pan and shovel prospector has passed almost completely into oblivion; his occupation is gone. The shallow surface mines have yielded their allotment, and the old prospector to whom this State owes her greatness has, like the "digging," about "yielded his allotment" too. The native sons turn from the pursuits of their fathers to less laborious vocations. This leaves the field of unopened mines to remain in primitive darkness, unless capitalists can be induced to take hold. The chances for investment in the opening up of these old channels offer inducements unequaled in the whole range of legitimate business.

Shasta.

LOWER SPRINGS.—Redding *Free Press*, Oct. 11: Monroe Thomson has shut his mine down in Lower Springs district. He is entirely satisfied with its appearance, having a fine ledge of rich ore. Further developments may be expected in the near future. Joe Penrose has discovered a rich ledge on Gambler's gulch.

CENTERVILLE AND SKY BLUE.—William Kellner showed us on Thursday some fine specimens from his new discovery near Centerville. One specimen of quartz had been broken in three parts, but was held together by the seams of gold running through. Kellner has taken out about $1000, and still has a two-foot ledge of good ore. L. A. Bouk has associated himself with Mr. Connor in the development of the Sky Blue mine, a mile and a half above Middle creek on the Sacramento river. Farther depth on the shaft and prospects in the tunnel show plenty of rich ore. These gentlemen are preparing to place a Kendall mill on the property. Mr. Connor is one of the best and most persistent prospectors in the county.

OF NO USE.—C. H. Sikes just finished hauling 85 tons of machinery and scrap iron from the Afterthought mine to Redding, to be shipped to Joshua Hendy & Sons, S. F. A brave attempt was made several years ago by a Mr. Stewart to make the rebellious ore of the Afterthought pay a dividend, but it was of no use.

DAM AND ARASTRAS.—The new mill of the Calumet Co., which will contain 21 Paul Americanized arastras, is moving on to completion. Part of the number are set and running. Several others arrived at the depot this week. As fast as they are received they are set up and started. This building of arastra mills on the Mexican principle is a new feature in California gold mining, and we think a good one, as arastras always give good results. This company has about completed a stone-cement dam at the head of their Spring creek ditch, which conveys water to their mills eight miles distant. The dam is one-third the thickness of its length and half the thickness of its hight. It is put in to stay.

OLD DIGGINGS.—Mr. Hart, of the Texas and Georgia mine, Old Diggings, will erect a 10-stamp mill on the Sacramento river to be fed with ore from the mine by means of a bucket tramway. Messrs. McCready and Luse have the contract for $1000 worth of wood.

Tulare

RICH FIND.—*Territorial Enterprise*, Oct. 9: A copper vein 150 feet in width has been discovered in the mountains back of Mineral King, in Tulare county. Assays have shown that the product shows 18 to 30 per cent pure copper and $107 in silver per ton. It is claimed that the find is as rich as any of the Lake Superior mines.

Tuolumne.

LUNDY ITEMS.—Homer *Index*, Oct. 11: Wm. P. Okbst and others have made a promising discovery on the red hill west of Saddle-bags lake. It is a ledge of carbonate ore assaying 50 to 70 ounces in silver and 60 per cent lead. May Lundy waste dump material is being screened and will be worked in an arastra. It would surprise many persons to know the amount of bullion that has been shipped from this district during the season, and considerable more is to follow.

NEVADA.

Washoe District.

ON THE COMSTOCK LODE.—*Territorial Enterprise*, Oct. 12: The following embrace the principal operations and events on and in the vicinity of the Comstock lode during the past week: The situation in Potosi is interesting and encouraging. An important development has been made in the south drift from the 1130 station in the winze, now sunk to the 1200 level from the 930. After excavating a working station at this point, they started an east crosscut and got into ore, and then they drifted north and southwest of the pay. The first day the south drift ran into quartz and porphyry of indifferent value; but it improved as the drift proceeded southward, and last Thursday it got into ore that assayed all the way from $12 to $80 a ton, the metal being poorly diffused through the mass. The width of this pay quartz is not yet known. The encouraging feature of this strike is that the diffusion of the precious metals is coming in more solid and richer as progress is made southward, where elbow-room for the existence of an extensive ore body is ample on every side. The scattering pockets of rich ore that have been found in the formation being prospected by the workings connected with the winze below the 930 level are indicative of the existence in that neighborhood of an extensive precipitation of the precious metals somewhere between the clay walls of that vein, and the management are determined to find out where. It is this fact which has kept up the stock of the Potosi to a good figure without any showing of more than mere pockets of pay ore. The winze is down to the 1200 level, and a south drift on the 1200 level is being sent out to connect with the bottom of the winze, both for air and to facilitate the working of the mine. The following information has been gathered from the weekly letters of the superintendents:

ALTA.—Crushing about 315 tons of $21 rock per week. No change in mining work.

YELLOW JACKET.—Shipping 78 tons of $19 ore daily to the Brunswick mill, and doing extensive prospecting work throughout the mine.

OVERMAN.—Extracted 416 tons ore. Shipped to Brunswick mill 431 tons. Battery assays average $16.08 per ton. Stopes on the 200 level and from winze below 1200 yielding about as usual.

CROWN POINT.—Are still extracting some ore from the 300 east stope, but the pay is becoming narrower as we go north and south on it. The 300 west stope looks about the same as last week. Shipped to the Mexican mill during the week 389 tons of ore, average battery assay, $15.45.

JUSTICE.—The work of cutting out the 822 station of the main shaft is progressing rapidly. No change of importance in the stopes. Shipped to the mill 191 tons of ore. Average battery assay, $30.66 per ton.

SAVAGE.—Extracting ore from the 500, 600, 750 and 1300 levels. During the week have hoisted from these levels 842 cars of ore; shipped to the Rock Point mill 391 tons and to the Mexican mill 380¼ tons. Milled 860 tons; average battery assay, $21 per ton. Have bullion on hand for this month's account, $9038. Have resumed work in the face of the southeast drift on the 1380-foot level and advanced same 45 feet.

HALE & NORCROSS.—On the 800 level the north drift was advanced 25 feet. Face in low-grade ore. Have taken out old pump rod and columns to the 600 level, and started repairing the incline at 1300 station, in order to resume explorations below this level.

UTAH.—In the main south drift from the west drift, at a point 600 feet in, east crosscut No. 2 has been advanced 76 feet; formation, porphyry showing clay slips and some quartz.

CHOLLAR.—Are making repairs on the 850, 450 and 750 levels. West drift, 60 feet south of north line, 850 level, has been advanced six feet; total length, 70 feet; face in hard porphyry. Have started an upraise from the drift that is up 12 feet in hard porphyry. Extracted and sent to the mill 524 tons of ore; average battery assays, $22 09 per ton.

POTOSI.—The winze below the 930 level is down on the slope 437 feet. The bottom is in porphyry with streaks of quartz. The north drift from the 1030 level winze station is out 56 feet, the last 10 feet being in quartz giving fair assays. The north drift from the 1130 winze station is out 57 feet. The face is in quartz and porphyry yielding low assays. The south drift from the main incline, 1230 level, is out 490 feet. Face in hard porphyry.

EXCHEQUER.—East crosscut near the south line, 600 level, is out 42 feet. Formation, quartz and porphyry. North lateral drift, 600 level, is out 48 feet; face in hard porphyry and stringers of quartz. East crosscut, 500 level, 150 feet south of north line, is out 179 feet; face in clay and stringers of quartz.

ALPHA.—East crosscut, 70 feet south of shaft, 600 level, is out 158 feet; face in quartz giving low assays. East crosscut, 70 feet north of shaft, 600 level, is out 93 feet. Face in quartz giving low assays.

CON. NEW YORK.—No work except repairing and easing timbers on 650 and 800 levels has been done the past week. The north drift on the 1100 level is now out 222 feet; face in quartz and porphyry.

SILVER HILL.—Northeast drift from the winze, 600 level, is advanced 15 feet through hard porphyry; total distance from the winze, 420 feet. Northwest drift, 334 level, is out from shaft 490 feet; face in porphyry and small streaks of quartz.

WARD COMBINATION SHAFT. — East drift from the 1800 station is out 595 feet; face in hard porphyry.

ANDES.—During the past week on the 420 level the north drift from No. 1 crosscut has been extended to 246 feet; formation, porphyry, clay and quartz giving low assays. The south drift from No. 1 west crosscut is extended to 43 feet; formation, porphyry and quartz.

GOULD & CURRY.—On the 200 level the northwest drift has been extended 12 feet; total length, 38 feet. Formation, quartz showing some value. On the 300 level the south drift has been cleaned out and repaired 50 feet; total distance, 370 feet. On the 625 level the south drift has been cleaned out and repaired 28 feet; total distance, 396 feet.

BEST & BELCHER.—On the 800 level the north drift has been cleaned out and repaired 100 feet. On the 1200 level west crosscut No. 1, 45 feet above this level, has been extended 18 feet; total length, 85 feet. Formation, porphyry and clay, with streaks of quartz.

TO BE REBUILT.—Eureka *Sentinel*, Oct. 11: The hoisting works of the Bay State mine at Newark, which were burned down about 2½ years ago, are to be rebuilt, and will be ready to run about Oct. 10th.

Tybo District.

A FAMOUS DISTRICT.—Belmont *Courier*, Oct. 12: The mill at Tybo has been repaired and work has been resumed in the mines, with W. D. Dimick as foreman. Some assays recently made of ore from Thomas Warhurton's mines, at Jett, gave fine results. The ore is very rich in silver and lead.

CHERRY CREEK.—The Muscle Co., which has been operating the Exchequer mine at Cherry creek for the past six months, has thrown up the lease and suspended operations. The boys did fairly well during the time they run the mine, paid all their bills and quit ahead of their summer's work. The mine will soon resume work under another management. The Merrimac Co. has purchased the Monte Cristo mill on the other side of White Pine mountain, and will move it to Cherry Creek, to be used in connection with operations in the old Star mine.

ARIZONA.

NOTES.—Prescott *Courier*, Oct. 4: A narrow-gauge railroad into our developed mining camps is now being very much agitated by Ex-Governor Tritle. The Rapid Transit mine, in Bradshaw district, is showing up better and better. The tunnel is 220 feet long; vein three feet thick, all good ore. The owners of the Hillside mine, are shipping high-grade ore from Garland's station, on the P. & A. C. railway. Muddy roads prevent teams from moving much ore to the railroad. Teams are constantly going to Congress with supplies and bringing in sulphurets. Mines of Upper Big Bug creek and adjacent camps want pack trains to carry ores to the Hope and Lowell mills. Alexandra, Peck district, which a few months ago was "dead as a nail," is just now a lively camp. The change is due to S. C. Mott's success in the Prince and Warrior mines. The Rowe mine is also helping out.

CLIFTON NOTES.—Tucson *Citizen*, Oct. 4: The Arizona Copper Co. is in a prosperous condition. The company is turning out large quantities of copper bullion and doing considerable development. At Morenci the Detroit Copper Co. is running three furnaces at full capacity. The Copper King Mining Co. at Clifton is building tramways from the mines to the smelters.

ORE CONCENTRATOR.—*Arizona Silver Belt*, Oct. 4: The concentration of ores in Arizona where water is scarce will be a future study of practical mining men. The first plant of this description is now being put up on the north side of the Dos Cabezas mountains.

BRITISH COLUMBIA.

IN THE HOT SPRINGS DISTRICT.—Fifteen men are at work on the Skyline, and about as many more on the United and No. 1. The rich streak in the United is next the foot-wall and is about 18 inches in width. In specimens brought to Nelson, native silver is almost as plainly visible as cube galena is in specimens taken from near the surface. Assays of $4000 and upward have been obtained, and fully two tons of the high-grade ore are now on the dump. Picked specimens of pure silver, nearly as large as a standard dollar, are on exhibition at the mine. The same character of ore has been struck in the Neosho, a claim about half a mile southwest from the United. The Neosho is owned by about a dozen of Ainsworth's leading citizens; every one of whom expects to make a large "nest-egg" out of the property. J. M. Buckley, at one time superintendent of the Northern Pacific system west of Helena, Montana, and more recently superintendent of the Spokane Falls & Northern, came in by the Galena pa

Monday to look at claims he has an interest in, and before leaving, made arrangements for prosecuting development work on them. S. H. Northey started for Butte, Montana, on Friday, for a steam hoist and pump for the Little Donald. The boiler will be 20 horse-power. The Little Donald is owned by the Davenports, and Mr. Northey has a contract for sinking on it. The Goat river district is said to be promising well, although prospecting is difficult because of the depth of alluvium. Two assays made last week gave 45 ounces in silver and 80 per cent lead, and 22 ounces in silver and 60 per cent lead. No news whatever from Trail creek this week.

COLORADO.

PITKIN ITEMS.—Aspen *Times*, Oct. 1: Work is in progress on the Silver Islet and Sacramento. From the latter mine some high-grade ore is being shipped. The Tin Cup country is also shipping some very good ore. This is hauled to Quartz, a station about 12 miles west of the Alpine tunnel, on the South Park road. Ore-shippers are now seriously inconvenienced by a scarcity of cars. The Aspen is, perhaps, most seriously affected. This mine now has some 1500 tons of ore tied up in Denver. It is producing at the rate of 200 tons per day, and has not storage capacity for more than one or two days' output. The Trainor mine is quietly shipping an average of about 12 tons of ore a day and developing into a big mine.

MISCELLANEOUS.—Georgetown *Courier*, Oct. 4: The Paymaster and Commonwealth are outputting their usual quantity of ore. There are no more steady producers in the county. The Lost Treasure and American Eagle lodes in Cascade district have been sold to the Ute Chief Mining Co. The consideration is $500,000. A strike has just been made in the J. C. Johnson mine, the property of the Standard Mining Co., which gives promise of being of the greatest importance. Twelve feet of solid lead ore has been penetrated, 18 inches of which runs 1460 ounces in silver to the ton.

PLACER MINING.—Elk Mountain *Pilot*, Oct. 9: Placer mining in Washington gulch has been shut down for the season. While there has been considerable work done, very little benefit in a financial return has been the result, and it will take another season to bring about that most desired by the parties engaged in the enterprise. The Metzler Bros. and Dr. Evans spent the most of the season putting new sluice-boxes in and preparing for active work next season. The McCay, Gray & Burton outfit have done considerable work in building a dam and putting in sluice-boxes. They have had a good deal of trouble in getting a hose to stand the water pressure. Aside from the delay caused by the hose bursting, they have been washing all summer, and have nearly reached the old channel, where so much rich dirt was taken in the early days of the placer mining in this gulch, nearly 30 years ago. In their summer's work they have unearthed cabins, picks and other evidences of the pioneer diggings. Much interest will be felt in the progress of this work next season.

STRIKE AT MINERAL POINT.—Crystal has been very much excited over the recent rich strike in the Illinois group on Mineral Point. Ira Cline was here last week and says it is really a strike of much merit. Ore assaying as high as 500 ounces of silver to the ton is found in quantity. Aspen parties by the name of C. P. Gentry and W. A. Reilly, have a bond on it and will work it vigorously all winter. These claims were located this summer by Frank Edgerton, Geo. Melton and Dave Lyons, and the discovery was made with very little work.

BIG THING IN O BE-JOYFUL.—The Callahan Bros. of Aspen have been over here for some time working their mining property, situated up at the head of O Be-Joyful basin. The boys do not make much blow about it, but they have got some property up there that will astonish everybody some day. It will take some capital to get it in shape to be a valuable producer, and the day is coming when that will be forthcoming.

DAKOTA.

A GOOD SHOWING.—The London *Mining Journal* of Sept 13th says: We are now able to give the result of a crushing and smelting of tinstone from Dakota. The tinstone received weighed 17 tons and 1562 pounds, and this yielded 1810 pounds of black tin, say 114 pounds, or over five per cent. This black tin assayed 70 per cent for metallictin. The quantity of metal in the ore obtained (1810 pounds) calculated on the assay of 70 per cent would be 1268 pounds. As a result of our smelting, we actually obtained 1229 pounds of refined tin.

EXPERT TESTIMONY.—*Pioneer*, Oct. 12: The Duluth *Herald* has interviewed Capt. Joseph Sellwood, an expert in both iron and tin mining, in regard to the Black Hills tin mines. He says there is no reason why within 10 years these hills should not yield at least half the tin used in this country. The ore-bearing veins are chiefly tin quartz, much like the Cornwall veins. They average about eight feet in width, and occur in a formation of soft slate, dipping at an angle of from 65 to 70 degrees. They claim in the leading properties an average of four per cent, and they have one unquestionably running as high as this or higher. But for precaution sake halve the claim, say two per cent, which from my own examination I am sure the ore will yield in practice, and then you have an ore running far better on an average than in Cornwall. The showing in this district is unquestionably fine, and would be so accounted anywhere. There is no reason in my judgment why more tin ore is not mined, except the high relative cost of labor. At Hill City you have got to pay $3 a day to good miners. At Cornwall, where I came from, the best men don't earn over £5 a month, and £3, or say $15 a month, is a much commoner rate of pay than $20 or $25. I was put to work in a Cornwall tin mine when I was but nine years old, and my leg was broken in dangerous work when I was ten. I never had a day of schooling in my life, and the boy who grew up with me, worked side by side with me in the mines from childhood as I did. If that is the kind of pay and training we want in this country, we can get cheap tin sure from the Black Hills, as well as in Cornwall.

THE BULLION MINE.—Last week a ton of ore was taken from the Bullion mine and run through the Gleedale mill, from which they obtained about 400 pounds of concentrates. The concentrates have been sent East for smelting, which is done, we understand, to thoroughly and definitely satisfy parties who have about completed arrangements to take a large interest in the mine. If all is satisfactory, about which there can scarcely be any doubt, very important work will be commenced at once. Mr. Albert Sellner, of Quincy, Ill., has been at the mine for over a week, and looked after getting out and concentrating the ore, so that the parties he represents will be fully satisfied with the results.

FLOAT.—A great deal of ore passes through town every day, a portion of it going to the D. & D. smelter and some coming from the Double Standard mine, which is now shipping ore to Omaha for treatment.

IDAHO.

SURVEYING.—Wardner *News*, Oct. 4: In a conversation with the surveyor-general yesterday, it was learned that the surveying of mining claims is very active at the present time, much more so even than during the same period last year. Applications for patents are pouring in from all over the State. Silver City and the Basin are very active in this respect, as are also Kootenai county and the Seven Devils region. In some localities there are at this time more applications for surveys than surveyors to make them. Throughout the State, in fact, there is a great demand for surveyors. Cinnabar ore has been discovered on Quicksilver mountain, the southern continuation of War Eagle mountain.

RICH STRIKES.—Boise *Sun*: Some wonderful discoveries in mining property have been made on the Idaho road near the Halfway house in the past few days.

MINES ABOUT IDAHO SPRINGS.—*Gazette*, Sept. 30: The Silver Age, which is the heaviest producer in this locality, is making preparations to work on a larger scale than ever. They have just completed laying 4000 feet of air pipe from Clear creek to the mine to carry compressed air from the compressor, which will be located on Clear creek. This will save the great cost of fuel. They have just completed an engine-room 500 feet from the mouth of the tunnel, where they will sink the main shaft. The engine will run by compressed air. They have 60 men employed and produce from 140 to 200 tons per month. The Dove's Nest, under Supt. John Owen, is probably the most systematically worked mine in the county; ore everywhere; shaft 400 feet deep; 1500 feet of levels; no stoping done. The Cincinnati is producing from 12 to 15 tons per month. The ore averages $160 per ton. The Esmeralda, belonging to the Idaho Tunnel Co., is worked under lease by eight men, who have a small vein of high-grade ore in the east end. The parties leasing on the west end are getting mineral in pockets. The Casino, which is being worked on the tribute system under the management of J. C. Simmons, has 30 men employed and is taking out from 70 to 85 tons of mineral per month, which averages $40 per ton. The Tenwall, worked under lease by Robert Callow, has eight men employed and produces 10 tons per month, which average $100 per ton. The Metropolitan, one of the old stand-bys, employs eight men, who are producing 20 tons per month, worth from $125 to $150 per ton.

SEVEN DEVILS.—*Citizen*, Oct. 10: Several sales have been made of late to prominent mining companies, who will commence development work at once. It is reported that the Old Peacock mine has been sold to parties from Kansas City, Mo., and Butte, Montana, at figures that show that property here is rapidly advancing in price. If the report proves to be true, it will be the biggest mining deal ever made in this locality. At present there are capitalists here from Denver, Colorado, Kansas City, Mo., and Wood River. The camp is booming and now is the time to make investments, as mines are cheaper than they will ever be again. The road is now nearly completed to the Peacock mines. Parties can drive to the Lockwood saddle, which is only 2½ miles from the mines. The road will be completed by the 15th inst. The Boston Co. will sink their shaft 100 feet deeper this winter, and also drift 50 or 100 feet to see the extent of their ore deposit. The Kleinschmidt Co. will sink several shafts on their property, and are now shipping ore. C. F. Drake, Supt. South Peacock Mining Co., has gone to Weiser to attend to the shipping of ore, and has sent several samples to be assayed. The bodies of ore that are in plain view at the Seven Devils are a surprise to all who have seen them. Quite a number pass by here on their way to the Devils most every day, that we do not get to see. Large nuggets of gold are now to be found in the ore. This great copper camp is being talked of more and more every day and the excitement is growing more intense with the arrival of every party of capitalists, and with every day there comes a new outfit, who have in many instances come thousands of miles to see the great and wonderful Seven Devils. Although the reports that are being circulated appear almost fabulous to those who have never visited the mines, yet one visit, however, is all that is required to convince the most doubtful of the truthfulness of all reports.

SALE AT BELLEVUE.—*Statesman*, Oct. 13: One of the biggest mining sales known for years in this section is about to take place. For days, rumors have been afloat regarding the transaction, but nothing definite was learned until this afternoon. It seems an English company is looking for investments in this region, and their attention has been turned to the mines around Bellevue. A party of experts are now on their way here to examine the properties, and there is hardly any doubt but that the sale will be made. The transfer will include the famous Minnie Moore and Twin Sisters, the Relief and also the Michigan. The two latter are owned by H. E. Miller, and the Minnie Moore is owned by an English company, of which the late John M. Kinnear was superintendent. The three properties are contiguous to each other, and if the sale is made, will be worked as one. Bellevue is feeling very jubilant over the outlook. Close on the heels of the victory in the county seat fight comes this good news, and in consequence the citizens are all wearing hopeful smiles in anticipation of a bright future for the Gate City. This sale means the employment of from 200 to 400 men in and around the camp.

LOWER CALIFORNIA.

NOTES.—*Lower Californian*, Oct. 2: The Princessa Co. of Alamo started extracting ore last week from its new rich strike in the Ulises. Mexican Gulch is coming up in the production of quartz. The Manzanita mill at Alamo has crushed several lots of ore which runs high. The Calmalli gold mines, located 300 miles south of Ensenada and 54 miles inland from Santo Domingo, and owned principally by Emiliano Ibarra, are reported as turning out considerable bullion which is shipped to San Francisco via Mulege, on the Gulf coast.

MONTANA

ALDER GULCH.—Anaconda *Review*, Oct. 11: Alder Gulch is coming to the front again and Virginia City seems to be renewing her youth. Several new strikes are reported in the vicinity and they are holding out in a way that is most encouraging. The Alameda, a new mine, promises to be a bonanza. The Champion Co. has been reorganized and the stock made assessable.

DEER LODGE ITEMS.—*New Northwest*, Oct. 3: Developments at the Lion Co.'s mine, Oro Fino district, are very satisfactory. The Standard is a St. Paul mining Co. organized for the purpose of developing the Patsywatomie group of mines on Indian creek, about four miles east of the town of Champion. The Mineral Hill G. & S. Mining Co. is a new company lately organized, with the principal office at Butte. The stockholders are M. E. Pinney, R. E. Pinney, J. W. Mishler, S. B. Calderhead and F. E. Parker. The two latter-named gentlemen are prominent railroad men of Butte. The company is stocked at 500,000 shares of the par value of $2 per share, and is made assessable after Jan. 1, 1892. There is said to be considerable excitement in Marysville over the reported discovery of a new mining district on Miller creek, which is equi-distant from Marysville and Helena, about 20 miles. It is said to be in a slate formation, and some very rich ore, carrying flake silver, has been picked out. There is said to be a five-inch streak of ore on one claim that runs $1800 to the ton. A large number of prospectors have gone out to investigate.

A STRIKE.—Butte *Inter-Mountain*, Oct. 11: A strike of unusual proportions in the Silver Bell at Castle is just now commanding attention. Ore carrying 160 ounces of silver and 47 per cent lead has been encountered at a depth of only 15 feet.

DEVELOPMENTS.—*Mining Review*, Oct. 11: Developments in Montana mines thus far during the current year have reached enormous proportions, and, judging from the present influx of Eastern and foreign capital in this direction, the number of dividend-paying mines in our young State will be doubled in the next six months.

CARDWELL DISTRICT.—Boulder *Age*, Oct. 11: Some good strikes are reported in the Cardwell district, and considerable development is going on in consequence.

NEW MEXICO.

FOLLOWED UP THE FLOAT.—*Western Liberal*, Oct. 10: There has recently been illustrated in this vicinity the old saying that "it takes a tenderfoot to find mineral." It is generally conceded that if there is a section of New Mexico which has been well prospected it is the country around Shakspeare. The other day W. B. Catchings, Col. May and W. D. Griffith were out riding. Mr. Catchings noticed a piece of rock, broke it open and asked Col. May's opinion of it. The Colonel said it was fine, and all hands went to looking for the ledge from which this had floated. The ledge was found and assays of samples taken from it showed it to be carbonates of copper and iron carrying about 28 ounces of silver to the ton. The main beauty of the ore, however, is its smelting qualities, as it is, according to Col. May, as fine a smelting ore as he ever saw.

A SUCCESS.—Prof. Waring of Silver City writes to the Humholdt Co. that he has completed his experiments with the ore from the Superior mine, and they were a grand success. The process consists of leaching and smelting. The professor will soon leave for New York to make arrangements for the erection of a plant.

A DRY CONCENTRATOR.—A. P. Granger, who has invented a dry concentrator, which he claims to be a great success, was in the city this week en route to Bowie, where he is erecting one of his machines.

OREGON.

GRANT COUNTY ITEMS.—*Weekly Red Rock*, Oct. 12: Clark & Trowbridge are having considerable work done on their placer ground over by Silvies valley, running cuts, etc. The boys of the Humboldt Co. are building a reservoir and making other preparations for a fall-run in their mine if sufficient rain falls. Mr. J. A. Whitman, who has for years been Grant county's most industrious prospector for hidden gold, brought some white quartz to town last week with chunks of the precious metal sticking to it. He has run a tunnel into the mountain a long way, and feels confident of tapping the ledge during the coming winter.

FINE SPECIMENS.—Several fine ore specimens brought in by David McCoy from the Elkhorn-Bonanza mine clearly show the great wealth of the district in which this mine is located. In speaking of the Elkhorn-Bonanza property, of which Mr. Fred Plau is manager, Mr. McCoy says the work of development has been done in a very scientific manner and reflects credit upon the mining ability of Mr. Pfau. Further, Mr. McCoy says that the Elkhorn-Bonanza is showing itself to be a fine property, and one that some day, in his judgment, will rank with the well-known Baisley-Elkhorn and Robbins-Elkborn properties, which are now turning out their thousands of dollars monthly.

AWAITING THE RAIN.—The extensive and well-equipped Wadleigh hydraulic mine is now in readiness for gravel-washing, awaiting only the advent of winter rains to begin. This is one of the most valuable properties of the kind on the Pacific Coast. No lack of water, rich gravel or fine timber here, nor is there any danger of the debris question ever coming up to trouble the hydraulic operator. A great gold harvest will be gathered from this ground henceforth and for a hundred years to come.

SILVER MINE ON ANDERSON CREEK.—Ashland *Tidings*, Oct. 12: The prospecting work done by the Empire Mining Co. of San Francisco at the Trombley mines on Anderson creek is reported to have developed a rich strike in silver rock. The report is that an 11-foot vein has been struck which goes $30 to the ton in silver. J. J. Owen, the principal man of the company, with two other San Francisco men, accompanied by Mrs. Owen and two other ladies, came up Saturday to visit the mine, and remained until Tuesday morning. They seemed much pleased with the prospects. The company has run one prospect tunnel 150 feet, and is at work upon another, and the belief is that they have struck a good silver-bearing ledge.

UTAH.

ORE AND BULLION SHIPMENTS.—Park *Record*, Oct. 4: The Ontario bullion product for the week was 33 bars, containing 19,067.93 fine ounces of silver. During the week the Crescent Co. shipped 270,700 pounds of concentrates and 43,100 pounds of J. M. Richardson's first-class lease ore. For the week just ended the Mackintosh sampler received and forwarded 606,030 pounds of Ontario ore; 135,440 of Anchor concentrates from the Union concentrator; 36,770 of Woodside ore; 28,980 of Apex; 11,560 of Hayt's Southern Tier ore, and 20,390 pounds of Flindt & Varcoe's Mayflower jiggings; total, 839,170 pounds.

NOTES.—Salt Lake *Tribune*, Oct. 5: The Woodside mine is looking fine and will soon be found in the list of heavy ore shippers. The Anchor tunnel continues to improve and is said to be a veritable bonanza. Work will soon be commenced on the Lucky Boy property and will be continued during the winter. The Centennial-Eureka is shipping in some of the richest ore that has been received here since the remarkably rich ores from Salmon river 12 years ago. From January 1st to October 1st the Ontario mine produced 736,058 ozs. of bullion and dividends to the amount of $675,000. The Daly mine has also paid regular monthly dividends aggregating $337,500 during the same nine months. The Horn Silver maintains its usual output, and is paying expenses and something more. Its stock, 1605 shares, sold in New York last week at $3.40 to $3.60.

STRIKE.—*Stock Exchange Journal*, Oct. 4: A very important strike was made a few days ago in Settlement canyon, Tooele county, where a free-milling gold-bearing quartz, running all the way from nothing to 200 ounces gold per ton, was uncovered. The claim where the strike was made is also one and had been abandoned.

THE MAMMOTH DIVIDENDS.—The Mammoth of Tintic is principally owned by the McIntyres of this city. The only information which the *Tribune* is able to give its readers concerning the operations today is that it pays regular dividends of $40,000 monthly, and that in last December and August an extra dividend of $40,000 was paid in each month.

THE EMMA STRIKE.—Salt Lake *Tribune*, Oct. 13: It will be remembered that some three months ago a strike of good ore was made in the Emma at Alta. This was tapped by running through the old workings of 13 to 18 years ago, and, carrying this crosscut on through new country a distance of 200 feet, the top of an ore chimney was cut. At that place the chimney was about four feet wide, with a thin streak of good ore. Since then it has been sunk on 125 feet, the vein all the time getting larger until it is now nearly 15 feet wide and has from three to four feet of good ore, with the balance good for milling. A sample lot of this ore was shipped down and lately sold. It assayed 120 ounces silver and 50 per cent lead, and sold for $155 per ton. Connections are being made with other portions of the mine by making an upraise and running some drifts. Now that Alta has about gone into winter quarters, prospecting will go steadily on till next spring, when the Emma ought to begin sending large quantities of ore to market.

FROM THE SMELTERS.—The smelters are finding a much larger local ore output this fall than a year ago, owing to the favorable results of silver and lead legislation. The project for a large smelter in addition to present facilities continues to be not only discussed but regarded as highly feasible.

SALT LAKE SYNDICATE.—The recent big sales at Tintic are having a good effect on outside capitalists and stimulating inquiries as to the merits of different properties in that wonderful district. It is understood now that a Salt Lake syndicate has been formed for the purpose of taking in some of the best properties of the north end, and that some great development work will follow if they get the claims being negotiated for. Work on some of the prospects in that locality is being pushed as vigorously as possible.

COAL FOR THE WEST.—The Rocky Mountain Coal & Iron Co, is shipping coal to relieve San Francisco of its coal famine. Last month they shipped 50 cars of 25 tons each, and shipments are going ahead faster this month. This company supplies the Central Pacific with fuel between Ogden and Carlin, and this takes an average of 750 tons a day. Their mines at Evanston are capable of sending out twice as much more coal, but cars cannot be had for this purpose, and then the Union Pacific has trouble in handling these cars, being so crowded with wrecks and business.

WYOMING.

THE GOLD HILL MINES.—Salt Lake *Tribune*, Oct. 12: The latest from Gold Hill, 23 miles from Saratoga, is to the effect that the discoveries have not been exaggerated. The following is given by J. L. Beagle, an old resident of Saratoga, who has just returned from the mines: "The road from Saratoga to Gold Hill is now completed, the ascent easy and no hills, making it a practicable route at all times of the year. Gold Hill, the summit of the range, is about three miles wide and five in length. The surface does not show many leads. Those are found by prospecting. A light fall of snow while I was there prevented my seeing much beyond the prospect-holes. There is no discount on the camp. Next year will see the largest camp at Gold Hill ever witnessed in the United States. But little more can be done this fall in the way of prospecting. Only assessment work will be done on many claims. Six or eight leads will be worked all winter. The mines are laying in a supply of provisions and will build houses and sink shafts. I would not be surprised if this proved a veritable gold hill in earnest. Sixty claims are taken and the miners feel quite confident. Gold Hill is covered with large spruce trees adapted for lumber and the miners are hardly able to find timber small enough for cabins. The altitude is about 11,000. In my opinion this hill is likely to prove to be entirely composed of quartz. The peculiar formation of the mountain renders the driving of tunnels an easy matter. The mining supplies are obtained at Saratoga, a short distance from the mines, and this is the only possible approach to these mines. The miners of Gold Hill say it is impossible to make a road from any other direction."

MECHANICAL PROGRESS

Nickel Plate for Armor Defense.

Several experiments have recently been made by the U. S. Government to test the relative durability of different kinds of armor plates for resisting the powerful projectile forces which recent progress in gun-making has rendered available. Three kinds of plates are used on ironclads—the Creusot plate, the nickel plate and the Cammell plate.

The two first named are French plates, and the last the plate armor used on English ships of war. The nickel plate stood this test the best of the three. The English plate was battered to pieces. At the last test, almost the whole of the three-inch steel plating had been carried from its iron backing. The shot had gone clean through the iron backing, also the oak supports. The two French plates had not been penetrated entirely.

Inspection at the close of the tests showed the Creusot plate was penetrated and cracked from circumference to center; the nickel plate was penetrated, but intact; the Cammell (English) plate was a wrecked armor. The nickel had proven the superior of the three.

In one of the trials the shot produced no specially damaging effect on the nickel plate. There were more disturbances than in the all-steel plate, but they were in the vicinity of the point of impact, and did not materially shake the reliability of the body of the plate. The projectile rebounded from a cleanly cut aperture.

Secretary of the Navy Tracy, and Admirals Kimberly and Folger, were among those present at the trials. Official reports of these trials state that the tests fully demonstrated the great superiority of the nickel plate over the English Cammell plate, which is manufactured by Cammell & Co. of Sheffield, and is the plate almost exclusively used on all the English armored war vessels now afloat.

The Nickel Plate to be Used by Our Government.

Congress has acted promptly on the results thus obtained, and appropriated $1,000,000 for the purchase of nickel to manufacture armor plates for the new line-of-battle ships. The above and other experiments have shown that when nickel is alloyed with steel, the breaking strain of the metal is increased 30 per cent, and it is rendered incorrosible. The prospects are the Government will secure a supply of the metal from the mines in the Sudbury district, Canada, which are chiefly owned and operated by Americans who can profitably mine the metal for 25 cents a pound. The deposit is an extensive one, and Krupp thought it of sufficient importance to recently make a personal visit to the district.

Improved Nickel-Welded Projectiles.

In this connection it may be interesting to note that the process of electric welding, which has been so widely used in its application to numerous manufactures pertaining to the arts of peace, has now been applied to the production of certain munitions of war in a very remarkable manner. The problem in making a shell for armor-piercing purposes has been to select a grade of steel with a view to its possessing the hardest point for armor-piercing purposes consistent with a chamber whose walls shall not be so hard as to crumble on striking a heavy mass. The metal selected for such purposes has been very naturally the result of a compromise in the endeavor to procure a metal which would give as hard a point as feasible under the circumstances, and yet the limitations of all materials are such that neither object has been perfectly accomplished, and the excessive hardness of the inside of ordinary cast-steel projectiles renders the work of clearing out the interior of the chamber very expensive. This application of the electric-welding process to the production of shells has reached very satisfactory results, entirely beyond those achieved by methods of manufacture hitherto carried on. The armor-piercing point of the shell is made of hard steel shaped in the conical form suited for such a purpose; to this is attached a tube of mild steel forming the chamber. The plastic state of the metal, when the two pieces are pressed together in the act of electric welding, forms a slight enlargement without cutting away any of the walls of the chamber. The butt of the projectile is made of a piece of mild steel, which is somewhat harder than the cylindrical walls of the chamber and is shaped to a cup-form by hydraulic forging. The slight exudation of the metal at the walls on the inside produces an interior ring, which is a material increase in the strength of the projectile.

This new application of the electric-welding process was invented by Lieut. W. M. Wood of the United States Navy, who has received a year's leave of absence, and is in the meantime associated with the Thomson Electric Welding Company. It is stated that the United States Government is ready to contract for a very large supply of these electric shells as soon as the machinery can be made for their manufacture.

COPPER IN STEEL.—Mons. Henri Schneider of the Creusot Works, France, has taken out patents for the process of manufacturing alloys of iron and copper. M. Schneider's plan is first to produce an alloy of cast iron and copper, and subsequently to use the alloy so manufactured to introduce a given amount of copper into crucibles of open-hearth steel. This is done by charging the furnace with copper, scrap and cast iron, making an alloy of from 5 to 20 per cent of copper, according to the purpose for which it is to be employed. The product is said to be remarkable for its great elasticity, strength, tenacity and malleability—properties which may be still further developed by chilling and tempering. This alloy is charged into the bed of a furnace with the ordinary ingredients used in the manufacture of steel, the special details for which are given in his patent specifications. The steel produced according to this invention generally contains from two to four per cent of copper, this being a sufficient quantity to impart to the metal the qualities of elasticity, strength and malleability to a remarkable extent; but the invention is not limited to these proportions. The steels alloyed with copper are especially useful in the manufacture of ordnance, armor plates, gun-barrels, projectiles, and for other military purposes, or in the manufacture of commercial sheets, bars and the like. They may be obtained with varying amounts of carbon, manganese, or silica, or silicium, according to the degree of hardness required and the purpose for which they are employed.

Steel vs. Cast-Iron Water Pipes.

Mr. Jas. C. Bayles, president of the Spiral Weld Tube Co., in a letter to a contemporary, says:

I venture the prediction that the days of the cast-iron pipe are nearing an end. They represent too much dead weight for too little strength. Wise engineers long ago reached the conclusion that the most costly and least satisfactory way of protecting iron against oxidation is with mere bulk of its own substance, and those most concerned in the future of cast-iron pipe, for business reasons, realize most keenly the fact that it is destined soon to take its place among the materials forced into disuse by the progress of the arts. Mr. Hamilton Smith, Jr., who stands very high in the profession of hydraulic engineering, in a paper contributed to the British Iron and Steel Institute, and published in Vol. I of its transactions for 1886, furnished data as to the life and strength of wrought iron and steel pipes for water conveyance, which left little room for further discussion.

The query presents itself: Why should not wrought iron, or still better steel, be used for conduit pipes in preference to cast iron? If it answers the desired purpose in California, why should it not do so in other parts of the world? To one like myself, who has for years been accustomed to the California practice, it seems as irrational to build a pipe, carrying water under considerable pressure, of cast iron as it would be to build a suspension bridge with the supporting chains made of cast iron.

The ideal conduit for high pressures is a welded steel tube; such tubes could probably be subjected to a tensile strain of 25,000 pounds with perfect safety, and would be much preferable to riveted pipe, not only on account of superior strength but also by reason of almost perfect interior smoothness. The adaptation of a superior and cheap metal, such as mild steel, for conduits, will permit the construction of hydraulic works in many parts of the world which now appears to be impracticable owing to the cost of many of the methods still in use for the transportation of water.

THE IRON AND STEEL MARKET.—The Chicago *Railway Review* says: If the railroad companies are not laying as much track as during some other years, they are purchasing other material and supplies in a very liberal way. Throughout the South a great deal of track-laying is going on and the companies are making heavy expenditures for rolling-stock, motive-power, improvements and additional equipment of various kinds. The car-builders and locomotive-builders have been picking up heavy orders within the past few days, and from reliable sources it is learned that several systems will be in the market within the next 60 days for additional equipment, it being the policy of the railroad companies to put their roads in the best possible condition. Three or four of the larger car works are now enlarging their capacity in order to meet the growing demand; the same is true of leading locomotive works. Iron and steel makers report a steady demand, without any fluctuations in prices. Steel-rail contracts are being booked in Pennsylvania mills at from $30.50 to $31.50. Sales of rails for the first seven months of the year, according to the report of the Board of Control, have been 1,273,444 tons, and during the same time shipments have amounted to 826,740 tons. One or two large blocks of German billets have been purchased by American users; domestic makers report a very heavy demand. The lake ore trade is active. Wrought-iron pipe mills are over-sold two or three months. Structural and plate-iron manufacturers report a steady demand. Merchant iron and nails are active. The iron trade outlook for the fall and winter is quite as favorable as it was a year ago.

"PROGRESSO," an Italian contemporary, says iron articles can be protected from rust by sinking them near the negative pole of an electric bath composed of 10 liters of water, 50 grammes of chloride of manganese, and 200 grammes of nitrate of ammonia. Under the influence of the current the bath deposits on the articles a film of metallic manganese, which prevents them from rusting.

SCIENTIFIC PROGRESS.

Electricity and Ozone.

Interesting Scientific Observations of Their Effect Upon Milk.

It is well known, says the London *Times*, that during thunder-storms milk tends to grow acid. An Italian, Prof. G. Tolomei, has lately tried to throw some light on the nature of this action. He experimented with electricity on fresh milk in three different ways—first, by passing the discharge of a Holtz machine between two balls of platinum, inserted nearly two inches apart in a bottle containing milk; second, by sending a battery current between two strips of platinum at the bottom of a U tube holding milk; and third, by subjecting milk in a test tube to the action of a strong battery current through a silk-covered wire, wound spirally round the tube. In each case the acidulation was delayed, not hastened. Three equal portions of milk from the same milking, thus treated, began to grow acid on the seventh, the ninth and the sixth day respectively; while milk not treated with electricity was manifestly acid on the third day. The electrified milk (unlike milk that has been heated to a high temperature, then cooled) coagulates naturally, or by action of rennet, just like ordinary milk.

Having thus seen that electricity could not be the direct cause of acidification of milk, the professor next tried the effect of ozone, and found it distinctly acidifying. In one case the surface of a quantity of milk was brought close under two balls of a Holtz machine, and the milk soon became acid in consequence, the sooner if the discharge was silent (not explosive), in which case more ozone formed. In another case, ozonized oxygen was made to bubble up through a quantity of milk, which in a few hours was completely acid, and soon coagulated spontaneously.

Prof. Tolomei is of opinion that oxygen probably also promotes lactic fermentation (a point which has been disputed). If milk keeps longer in wide, shallow vessels, that is probably due, he thinks, to the cooling produced by evaporation, which is favored by a wide, open surface.

New Fiber Plants.

The discovery of new fiber plants to take the place of such standard fibers as cotton, flax and jute, is constantly being announced; but after attracting attention for awhile they always fall back again into comparative obscurity. The latest announcement of this kind is made in a Savannah, Georgia, journal, which devotes two columns to the discussion of a new substitute for jute, discovered by O. B. Warrand of that city, who has patented inventions for the various processes for working up the fiber into its several uses. This new substitute is a distinctively Southern product, known as the saw palmetto, or palm, which grows luxuriantly in South Carolina, Alabama, Georgia and Florida. Mr. Warrand says that two tons of the green plant will make one ton of dry leaves and stems, and this one ton of dry material will produce $25 worth of tannic acid, $16.25 worth of bagging fiber and $4 worth of fine refuse that can be utilized in paper manufacture; a gross moneyed production of $45 25 for one ton of dried leaves, the material of which will cost not more than $10 to $12. He says that it will require ten tons of green pine straw to make one ton of fiber, and from 13 to 14 tons of cotton stalk, thus showing that the saw palmetto is more productive of fiber, as well as being a less costly material. He says that the two-pound jute is the standard bagging, whereas palmetto bagging weighing but 1¾ pounds to the yard will be as strong as the 2¼ jute, and will not discolor the cotton, as it is claimed the pine-straw bagging will.

Another, is an official report to the Belgian Government which states that the "gulmbobo" or "angu," of the Mexican State of Vera Cruz, possesses a fiber finer and stronger than silk, and of similar luster. Experiments already made are said to indicate that the gulmbobo differs essentially from ramie, cotton and hemp, in having the plant covering around the fiber instead of mixed up and interlaced with it. This makes it practicable to separate and remove the bark by means of machinery. The plant grows luxuriantly with little care and produces highly esteemed food in addition to the fiber.

HARDENING THE EXTERIOR SURFACE OF STONE.—Soft oolitic limestone, or limestone with spherical granules, is now hardened into marble by treatment with a certain chemical solution, which gives to the stone a thick, strong skin about half an inch deep, capable of a fine polish. Soft oolite can thus be worked into any form and hardened afterward. The marble becomes impervious to damp and atmospheric influences.

MYSTERIOUS PICTURES.—Amateurs in photography and chemical magic may get much amusement from the magic photographs described by a French scientific journal. Positives are printed from any negatives upon chloride of silver paper, and are fixed, without toning in any gold solution, in a ten-per-cent bath of hyposulphite of soda. They are next thoroughly washed to remove all trace of the salt. The prints are then placed in a five-per-cent bath of bichloride of mercury, in which the images gradually fade and soon disappear entirely. When the bleaching is complete, the paper is washed and dried. To make the latent images reappear, it is only necessary to immerse the white paper in a five-per-cent solution of sulphits or hyposulphite of soda, or, what is more illusive, to place the bleached photograph on a sheet of blotting paper previously saturated with sulphite of soda, and dip both in pure water. The chloride of mercury is converted into black sulphide of mercury, and the chloride of silver which has formed in the bichloride of mercury is dissolved.

EXHAUSTION OF NATURAL GAS.—Professor Orton of Ohio, in a paper recently read before the American Association for the Advancement of Science, stated that there is not the faintest doubt that the natural-gas supply in the Indiana and Ohio fields is not only exhaustible, but is rapidly and surely being exhausted. He said he had yet to find a man conversant with the existing facts who does not entirely agree with him. The gas is stored in the rocks, where it has been for untold ages. It is not now being generated, and every foot that escapes to the surface leaves the quantity remaining for future use just so much smaller. The pressure of gas in the wells of Ohio and Indiana fields is steadily diminishing, the decrease already having amounted to 30 or 40 per cent. In view of this, Dr. Orton urges the imperative necessity for cities and States to take action restricting the lavish and wasteful use of gas. Even the strictest regulations cannot prevent the exhaustion of the supply of gas in a few years, but they may put off that exhaustion some time.

A CHEMICAL LUNG.—A device which is called a chemical lung is the latest thing proposed for the ventilation of tunnels. It was lately tested in London by fourteen scientists. A room 18x15 was kept for an hour at a temperature of 82° and the air was loaded with impurities. The men of science were now called upon to enter, and the air was made still more impure by burning sulphur and carbonic acid gas. Then the "chemical lung," or punkah, so called, measuring 4x2.6, was set in motion. The temperature was soon reduced to 65° and the air freed from all impurities. Then fat was burned, to test the machine for organic substances, and the "lung" was started up just in time to prevent the examining gentlemen from running out for fresh air. It is proposed to use the invention during the construction of the channel tunnel.

PRECIPITATING SEWAGE.—What promises to be one of the most useful discoveries of the age, says the *Sanitary News*, particularly in reference to sanitary science, and one affecting every living being, is that made by Mr. Woolheim of London, Eng. This is a new method of precipitating sewage, and has been well tested in that country. Ammonia gas is the disinfecting power used, and it is said that when it is introduced into sewage it very quickly destroys the microbes of putrefaction and of many diseases; the odor of the sewage is carried away, and in less than an hour it is both deodorized and sterilized. Dr. Klein supports the discovery and confirms all the claims made by the discoverer. If the discovery should be thoroughly verified it will practically revolutionize the sewage system.

THE *Iron Age* says: Railways controlled by the Government are not beyond the reach of labor disturbance. The experience of Australia, where all railways are built and operated by the Government, is far from warranting the conclusion that State ownership of the transportation lines is desirable. The combination of labor is there more widespread and effective than in America, so effective, in fact, that the Government is compelled to regard the dictates of these organizations in the management of the railways. A strike is quite as liable to happen under State control as under private control, and its consequences are apt to be more serious, because of the political force at the disposal of the strikers.

KNOWLEDGE OF ANCIENT ROME.—The *English News* states that the commission in charge of the improvement of the City of Rome has unearthed great quantities of lead water-pipe, each plainly stamped with the name of the owner of the house, the year of the plumbing, the name of the consuls for that year, and that of the reigning emperor. In opening the 82 miles of new streets in that city, material has been found sufficient to add to our present knowledge a thousand details concerning the baths, heating flues, water pipes and house sewer pipes, the organization of the police and fire brigades, etc.

THE WORK OF THE HEART.—The heart contracts with power enough to send a column of blood 7½ to 9 feet high. At every beat of a heart of average size and strength, the force exerted is equal to moving over 50 pounds, or to lifting a pound weight upward a distance of 3½ to 4½ feet, say 4 feet; or to carry 4 pounds 1 foot upward.

SOUND WAVES.—It is estimated, from a careful microscopic examination of the impressions which the little word "hello" makes on a phonographic cylinder, that it produces not less than 16,000 indentations.

USEFUL INFORMATION.

The Cotton Centenary.

The celebration of the Cotton Centenary at Pawtucket, R. I., beginning Sept. 29th and ending Oct. 4th, was quite a grand and stirring affair. It was in that city that Samuel Slater put into operation the first machinery for spinning cotton that was ever started on the American continent. Mr. Slater is also believed to have been the first person on this continent to establish a Sunday-school; consequently the celebration was made a double one. All the Sunday-schools of the city and neighborhood were invited to take part in the celebration. Mr. Slater has been very properly called the "Father of American Cotton Manufactures."

The occasion was made in part an industrial exhibition, showing the progress which has been made, especially in the cotton industry, during the last hundred years. In addition to the exhibits of modern machinery, there was also a large and interesting display of articles directly connected with Mr. Slater's successful efforts in establishing on the western continent cotton spinning with machinery driven by water-power. Among the collection was one of the identical spinning frames and carding machines built by him on his arrival in Pawtucket 100 years ago; also one of the old hand-looms which were used previous to the introduction into this country of the power-loom, together with the original model of the cotton gin invented by Eli Whitney, as well as one of the oldest cotton gins in the United States. A son and grandson of Mr. Whitney were present on the occasion.

The last day of the celebration was devoted to a "King Cotton Karnival," on which occasion "King Cotton" made his triumphal entry into Pawtucket, and was given the "freedom of the city."

The old, original "Slater Mill," built in 1793, three years after his machinery was first put in operation in a temporary locality, is still in existence and is an object of much interest in Pawtucket. Also the "Old Mill House" in which Mr. Slater lived, and where he commenced his Sunday-school. The occasion was one of much interest and well worthy of such public remembrance.

THE FINEST BROADCLOTH.—It may not be generally known that the finest piece of broadcloth which ever left a loom was manufactured at the Vassalboro woolen-mills of Maine. It was first exhibited at the World's Fair in London, in 1851. It was exhibited at the Centennial in 1876, and was pronounced by the judges in that line of goods as unsurpassed by anything of the kind there on exhibition. There is no public recognition of any other manufacture of broadcloth superior either in texture or finish. It stands to-day unequaled by any goods of its kind on record. This fact is well established, and should be more widely known as evidence that nothing is impossible in American hands which can be accomplished anywhere else. The only reason why these superior goods are not made on a commercial scale is because the high price of labor here forbids it. In this connection we may also state a fact well known on this coast, but not so well known elsewhere, that the finest woolen blankets ever produced in the world were made at the old, but now defunct, Mission woolen-mills, in this city. Those blankets were exhibited at several European expositions, at our own Centennial, and at various exhibitions in this city, and never met an equal in either texture or finish. There is nothing in the world's general produce in the way of skill which Americans cannot attain if they are only properly paid for it.

PENSION MONEY.—The disbursement of pension money by the United States Government from 1861 to 1889, inclusive, has been a fraction over $1,052,000,000. The monthly rates are mostly four, six, ten and twelve dollars to each person. Ohio has the largest number of pensioners; then follow, in order, New York, Pennsylvania, Indiana, Illinois, Michigan, Missouri, etc. There are still on the pension rolls 27 surviving widows of Revolutionary soldiers. The last soldier died some years ago. The rolls also contain two daughters of Revolutionary soldiers, who were made pensioners by special Act of Congress. Three of the widows are 97 years old. The youngest is 71. No record of any other nation ever contained such a remembrance of its soldiers.

BORAX AS AN INK INGREDIENT.—It has long been known that a solution of bichlorate of sodium or "borax" possesses the property of dissolving or softening various resins which are unaffected by plain water and by the great majority of saline solutions. As a basis for a permanent label ink, unaffected by water or moderately strong acids, there is nothing equal to a half-saturated solution of ordinary borax, duly charged with as much orange shellac as it will take up on boiling for 20 minutes.

AN AMERICAN CARPET IMPROVEMENT.—An important improvement in the manufacture of Wilton and Moquette carpets has just been patented by R. B. Loynd of Worcester, Mass.

TENSION OF A HAIR.—That a single hair can support a weight of two ounces, and is so elastic that it may be stretched to one-third of its entire length and then regain its former size and condition, is possible, according to an assertion of the *Southern Critic*.

THE LONDON POOR are justly indignant because the wholesale fish-dealers of that city frequently destroy hundreds of tons of fresh fish in order to keep the prices up.

THE CHINESE, as early as 969, fastened rockets to their arrows so that the latter might be thrown to a greater distance.

BEEF loses 25 per cent of its weight when baked.

GOOD HEALTH.

PREVENTIVE MEDICINE.—It is to be feared that the time is far off when mankind will be wise enough to pay their money for being *kept* in health. The following remarks by Dr. W. W. Johnson, in the *Medical Advance*, are to the point: "We doctors get the most praise when we make the biggest fools of ourselves. When we prescribe accurately and a disease is nursed in its incipient stages, nothing is thought of it. It is passed over as of no great importance, and the chances are that the patient is deemed foolish for calling a physician to such a simple case. But if the prescription be a poor one, as many of them are, and the disease takes its natural course, assuming from day to day its progressive and various symptoms, how changed then the conditions! Nurses and attendants move with bated breath, the friends hang on the words and even the looks of the physician. At last the disease having run its course, nature winning solely through a strong vitality, the patient is pronounced convalescent. Then sound the praises of the doctor. What a mighty man he is! Before his august presence grim Death slinks away and yields up another victim to his mighty power. Herald his fame abroad, that suffering thousands may avail themselves of his sapient skill. Does the doctor know he didn't cure the patient? Yea, verily, let us hope he does. Does he tell the friends of it and bid them hold their peace? Oh no, he's no fool, though sometimes foolish.'

THE USE OF VINEGAR.—Far too much vinegar, says a good medical authority, is used to be compatible with good health. The general belief is that it is a wholesome and necessary adjunct to our diet; but really it might be almost entirely dispensed with except for pickling purposes. If used, it should be used sparingly. A slice of lemon is far preferable as a substitute, and lime may be used if convenient. If vinegar must be used, that made from wine is much more wholesome than that made from cider. In this connection the following upon the effects of acids and alkalies on the stomach from *Good Health* may be read with profit: An eminent Polish physician, Jaworski, has been experimenting to determine the effects of acids and alkalies upon the stomach. He finds that acids precipitate mucus, cause bile to flow into the stomach, increase the amount of pepsin in the gastric juice, but not its acidity, diminish the flow of gastric juice, and in excess, produce disturbances of digestion. Alkalies, on the other hand, dissolve mucus and decompose pepsin. These facts explain the evil results arising from a continued use of vinegar, baking powder, saleratus, soda and similar substances commonly used in cookery.

DEADLY CATERPILLARS.—The Philadelphia *Press* gives an account of a man, 32 years of age, who recently died of blood poison caused by the bite of a common green caterpillar. He was bitten upon the neck as he lay on the grass. The same paper tells of a young lady, 21 years of age, living in Philadelphia, who was at the time in a dangerous condition from the bite of a green caterpillar, which she received while sitting under a grapevine. Severe illness, and even death, is sometimes caused from the bite of a fly. In all such cases, death, or severe illness, is caused by blood poison superinduced by the bite; and it is supposed that insects, usually harmless, whose bites are thus dangerous, have recently come from feasting upon some deceased and poisonous meat or other substance whence the poison virus is taken.

BLOOD TRANSFUSION.—The operation of the direct transfusion of blood, says the New York *Sun*, is becoming quite common in the great hospitals of that city. It is performed as often as once a month, but not always, however, with success. Of late a similar operation—injecting an artificial fibrinated fluid into the veins of collapsed patients—has become still more common. Remarkably successful results have many times been obtained.

A REMEDY FOR CHOLERA. it is claimed, has been discovered by a Frenchman from Cette. People either attacked by or in fear of the disease must sit for some hours in a garment soaked in paraffine, which irritates the skin, producing a healthy reaction, and kills the cholera microbe. Very doubtful.

DEATH FROM SEASICKNESS is so very rare that the case of Mrs. James Pierce of Toronto attracts attention. She never recovered from the nausea induced by a trip upon the Great Lakes.

THE BUILDER.

THE MEASUREMENT OF BRICKWORK.—It is curious to observe how considerably the method of measuring brickwork varies in different parts of the country. In many localities, Philadelphia for example, the custom is to measure it by the number of bricks contained, but this system possesses a serious disadvantage. There is no uniformity in the size of bricks, and hence the size of a wall which a given number of bricks will produce is uncertain. When, therefore, the price per 1000 for laying brick is given, considerable trouble is involved in arriving at the cost for the whole of the brickwork in the building. The better plan is to measure by the dimensions, as is common in some parts of the country. The cubic foot or yard is employed to some extent, but the perch of 25 cubic feet and the superficial rod in brickwork one brick thick are often used. Unfortunately, the term "rod" has no very definite significance. One and a half bricks thick, covering an area of 272½ square feet, and one brick thick, laid on an area of 16½ square feet, or 63 square feet, are all termed "rods." [The English "rod" of brickwork is 306 cubic feet.—ED.] Under these circumstances it would probably be of advantage if the cubic foot or yard could be made the standard unit of measurement for brickwork throughout the country. The number of bricks contained in any piece of brickwork may be approximately ascertained by deducting one-tenth for the volume of mortar.—*Clay-Worker*.

CHARRING PILES BEFORE CREOSOTING.—Wm. Kinnison of the Carolina Oil & Creosote Co., writing to the *Engineering News* on the subject of preserving piles exposed to the ravages of the toredo, says he has become convinced that whatever antiseptic is used to resist the invasion of this destructive insect, piles, before being treated otherwise, should first be thoroughly charred. The destructive temperature to which the exterior of the pile is subjected in the process of charring, kills all germ life existing in the green wood, opens the pores to the absorption of the antiseptic, and surrounds the log with an armor that, so long as it lasts, is impenetrable to the teredo because of the destruction of the nutritive upon which the worms thrive. The perfectly sound condition of the piles in the Government wharf in Charleston harbor, which were charred and creosoted in theyear 1883, is a striking proof of the efficacy of this process. It should be remembered that untreated piles are eaten completely through at Charleston in less than two years by the ship-worm. The Nicaragua Canal Construction Co. has become convinced of the value of charring and has given orders to char all the piles being prepared for the Greytown harbor work at the Wilmington Works.

FIREPROOFING EXTERIOR SURFACES.—It is found that a most effective composition for fireproofing exterior surfaces may be formed by slacking a sufficient quantity of freshly-burned quicklime of the best grade, and when the slacking has become complete, adding such an amount of skim milk or water in its absence as will make a liquid of the consistency of cream. To every ten gallons of this liquid are added, seperately and in powder, and with constant stirring, the following ingredients in the order named: Two pounds of alum, 24 ounces sulphate of potassium, or commercial potash, and one pound of common salt. If white paint is desired, no further addition is made to the liquid, though the whiteness is found to be improved by a few ounces of plaster of Paris. Lampblack has the effect of giving a number of shades from slate color to black. But whatever tint is used, it is incorporated at this stage, and the whole, after being strained through a sieve, is run through a paint-mill. When ready to apply, the paint is heated nearly to the boiling-point of water, and is put on in its hot condition. It is also found that the addition of a quantity of fine white sand to this composition renders it a valuable covering for roofs and crumbling brick walls.

A SUBSTITUTE FOR COMMON BRICKS.—What are termed hollow cast iron bricks form the subject of a recent German patent described in the technical journals, the article being the invention of an Erfurt mechanic. As the name indicates, they are made of regular brick form and size, the walls being 0.12 inches thick, but no mortar or other binding material is intended to enter into their use, the method of fastening adopted being as follows: The upper and lower sides of the bricks are provided with grooves and projecting ribs, which fit into one another easily and perfectly, so as to make a uniform and complete union or combination. There are in addition two large circular openings in the upper side of each brick, arranged to receive suitably formed projections on the lower side of the brick above, one of these projections being also hook-shaped, thus insuring a solid hold; and in order that the joints be made and remain air and water tight, a fluid is applied to the surfaces of the bricks with a brush. The non-conducting air spaces in the bricks, and the ease with which they may be put together and taken apart without injuring them, are cited as special advantages in their favor as a substitute for ordinary bricks and brick construction.

THE LIFE OF TIMBER IN USE FOR BUILDING. One of our exchanges publishes an account of the demolition of the famous Endicott mansion, at Salem, Mass. Built of oak in 1628, its sills, posts, girts, and other framed timbers are still sound, showing under favorable circumstances, that oak timbers, selected with care and properly hewn, may endure for three centuries or more. The famous choir stalls at Rheims are of carved oak, and, it is believed, were completed in 1300. They have received constant attention in the way of oiling and rubbing, it is said, and are to-day in sound condition.

ELECTRICITY.

HOW TO MAKE A STORAGE BATTERY.—The *Journal of the Telegraph* gives the following directions for making a simple storage battery: Get two half-round porous cups, and a round glass jar large enough for the two porous cups to stand in upright. Get two plates of sheet lead 1-16 inch thick, wide enough to fit the half-round side of the porous cups, and deep enough to come an inch or so above the top edge of the cups and jar. Solder a stout copper wire or binding screw to each lead plate at the top. Place the lead plates in the cups and fill the cups nearly full with a paste made of red lead mixed with a solution of sulphate of soda, thin enough to run like a cement. The glass jar containing the two cups should be filled to within a half-inch of top of the cups with sulphuric acid and water, about one part of acid to eight of water. The plates should be marked, so that, in charging, the currents may be sent in the right direction. The cell may be charged by attaching it to a series of a dozen sulphate of copper cells for 24 hours, or from a dynamo. A wooden cover may be fitted to the glass jar, and evaporation of the fluid should be replenished by adding water. Two or more cells of this battery will work small motors, lamps and induction coils; and if thoroughly charged, will retain a large volume of electricity for a considerable time. After once being well charged, four to six cells of sulphate of copper battery will recharge it.

PLATINUM AND ELECTRICITY.—The rapid development of electrical appliances have had the effect to raise the price on several kinds of metal and especially platinum. This metal has been used quite extensively in the manufacture of jewelry, and is quite expensive at the present time, being quoted at $14 per ounce. The reason for the advance in price is said to be chiefly owing to the demand for it by electric-light concerns, and also the fact that the product is growing less. The amount of platinum used in the manufacture of electrical apparatus is enormous. Each electric light contains about six inches of platinum wire, and if the metal is not pure it will not stand the great heat. As the electric light grows more in favor, the demand for platinum is greater, and unless some substitute can be procured, the chances are that platinum will be indeed a precious metal. Here, then, is an opportunity for some inventive genius to put his art to work at good advantage in finding a substitute for this expensive metal, which promises to go even higher than at present.

SMALL MOTORS MOST ECONOMICAL.—The economy of small electric motors for industrial purposes is shown in a shoe factory in Brockton, Mass., where for the last year and a half a 25-horse power motor has been running the machinery. This is being replaced with three motors of 15, 10 and 5 horse power respectively, and a saving of 6-horse power is looked for from the change. The electric-power company that furnishes the current agrees to charge less for the current for the three small motors than it did for the one large one.

ELECTRICITY AND MINING.—An important section in next year's International Mining Exhibition at Frankfort will be a section devoted entirely to mining operations. The different applications of electricity to mining purposes will be demonstrated in such a manner as would obtain in practical work, and this will be the case in all the sections. Messrs. Siemens and Halske of Berlin will have, in addition to three other systems of electric traction, an electric railway for mining purposes in operation.

ELECTRICITY FOR CANAL BOAT PROPULSION. *Electric Power* for September recommends electric propulsion for boats on canals. It says: It is simple enough. Stretch a trolley wire over the canal, put a motor in each boat, locate a dynamo at the different locks and inclined planes, and speed and comfort will follow. Not a pound of steam is needed for the locks, and inclined planes will furnish enough water-power by the aid of water-wheels to generate all the electricity needed to propel every canalboat.

ELECTRIC RAILWAYS.—According to the *Electric Age*, there were, on Aug. 1, 1890, 223 electric railways in operation and under contract in the United States and four in Canada.

INCANDESCENT LAMPS burn out quickly if worked above their proper pressure, and last unusually long if operated a little below their normal voltage.

TO MAKE CEMENT for electric apparatus, mix one pound of beeswax, five pounds of resin, one pound of red ocher and two ounces of plaster of Paris.

MINING AND SCIENTIFIC PRESS

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[NEW THIS ISSUE.]

Gold Saving Device—Chas. Trafton, Yankee Jim's, Cal.

Situation Wanted—"Chemist."

See Advertising Columns.

Passing Events.

While recent accounts from Alaska are favorable as regards vein mining, the placer miners, especially on the Yukon, appear to have had a bad season of it, the weather having been rainy and otherwise unpropitious.

The labor world continues everywhere in a state of perturbation and unrest; less so on this coast, however, than almost anywhere else. Instead of coming to an amicable understanding or agreeing upon any plan looking to an adjustment of their differences, labor and capital, the laborer and his employer, seem to be drifting all the while farther and farther apart. There is in this cause for deep concern.

Contrasted with these thousands of men going out on strike, there comes from Idaho a call for 2000 men to work on the Cœur d'Alene branch of the Union Pacific railroad.

A notable event in the industrial world is the prospect in this country of immense establishments for the manufacture of tin plate, an article for which we have heretofore paid foreign countries enormous sums annually. The plant already projected will, it is estimated, cost eight or ten millions, the new industry giving employment to many thousand hands. The tin ore for supplying these works will be obtained mainly from Dakota, Wyoming and California.

The weather everywhere on this coast has, during the past week, been favorable for all our leading industries, mining included. A considerable amount of snow has, however, fallen, and much is now lying not only on the summits of the Sierra, but also on all the higher mountains throughout the interior. On some of the ranges in Nevada more snow has already fallen than fell the whole of last winter. From all this there is promised a good water season next summer.

Several Important Events to Stockholders.

Several events took place the past week which may have quite an important bearing on future mining operations on the Comstock lode; the most noticeable of which are first the contest for the control of the Andes Mining Company; second, the questions asked by a stockholder of Con. Virginia Mining Company's shares of the president and directors of the company at the regular annual meeting; third, the forced resignation of Mr. Conradt as superintendent of the Kentuck Mining Company and the appointment of S. L. Jones, superintendent.

The contest for the control of the Andes Mining Company is said to have been made by J. L. Flood, owing to a very rich development on the 800-foot level in Con. Virginia, over 1200 feet west of the latter's shaft. This find, it is reported, is in the Andes grounds. It is said to be the well-defined Red lode which is largely gold bearing. After several meetings, overhauling books and accounts, no change was made in the management of the mine. The only change was in the secretary resigning and in the election of P. H. Andros to the position. The former secretary is reported to be a close friend of Mr. Flood, while the latter is closely identified with M. W. Fox, the principal contestant against Mr. Flood. What the effect of not securing control of the Andes mine, by those who control the Con. Virginia mine, will be on the future of the Comstock mines and also upon the stock market, every reader must be his own judge.

The questions asked by a stockholder at the annual meeting of the Con. Virginia Mining Company are such as could be readily answered by the officers here, provided they demand detailed information in the interest of stockholders, of all workings at the mine. The questions were referred to the superintendent at Virginia City to answer, at his earliest opportunity.

The changing of the superintendent of the Kentuck mine brings that historic ground to the front. The company owns 95 feet of the Comstock lode between the Yellow Jacket and the Crown Point mines at Gold Hill. This 95 feet is probably one of the most interesting locations on the lode. It claims the distinction of being the piece of ground in which John W. Mackay and the late U. S. Senator Sharon made their first money on the Comstock and which was the nucleus of their subsequent large fortunes. In those days all stockholders were permitted to share, pro rata, in the profits of the mines, which profits came to them in the shape of dividends. This was in the sixties and seventies.

In 1881 a new order of mining was inaugurated on the Comstock lode evidently, as past events prove, to kill off all outside or small stockholders in the mines. It was in that year Mr. Conradt (superintendent of the Kentuck mine, who was forced last week to resign), then foreman of the Kentuck mine, while making a manway on the 160-foot level to connect with the Yellow Jacket mine to afford a means of escape for the miners in case of accident, came on a narrow body of high-grade ore, selected samples of which assayed about $400 to the ton. The knowledge of this find was kept from other stockholders by the late C. C. Stevenson, who at the time was superintendent of the mine. When the latter person had purchased enough stock to give him the control, he had his broker, H. H. Noble, put from five to ten shares of the stock in the name of five men who were elected trustees of the company. These men in their official capacity signed a contract with C. C. Stevenson, whereby the property and the body of newly discovered ore were made the property of the contractor. They even went so far as not to appoint a superintendent to look after the interest of other stockholders.

A few of the outside stockholders filed a complaint in the courts exposing the fraud, and after a prolonged trial, the court ordered an accounting by Stevenson to the plaintiffs. The whole matter was referred to a referee. Stevenson and his dummy-directors finding themselves cornered, settled with the stockholders who brought the suit at the rate of $40 per share and the costs of suit.

It may be of interest to stockholders in the Kentuck Mining Company to know that the now president of the company is the same president who voted for the contract with C. C. Stevenson, and who admitted that 2000 shares of the stock standing in his name as "Trustee" belonged to the contractor and was simply held in trust by him. Besides this, a majority of the Board of Directors to-day are the same men that renewed from year to year the illegal contract in defiance of the protests of other stockholders.

This same ore-finder, Mr. Conradt, has lately discovered another body of rich ore. His letters on file in the office of the company in this city show assays ranging within the past thirty days from about $40 a ton to over $1000 per ton. Since finding this body of ore Mr. Conradt has been removed. This removal awakens suspicions that he was giving away too much information. His removal also causes many to think that possibly if he had been retained as superintendent, the ore could not have been either successfully hidden or spirited away by the mill ring, and outside stockholders assessed to pay for its extraction and milling.

The course of the new superintendent, S. L. Jones, will be watched with unusual interest to see what he will do toward developing the new and important ore body.

Brighter Days for Nevada.

As is generally well known, the State of Nevada has, for a number of years past, been far from prosperous, her population having been steadily decreasing, and all her material interests apparently on the wane. Last winter more than decimated the flocks and herds of her sheep and cattle men, giving what was considered the finishing blow to this branch of business. The bullion product of the State, though showing some little increment during the past few years, has still remained comparatively small; and thus with all her leading industries stinted and crippled, her mines neglected and her population diminished, the once-renowned "Sage Brush" State has become the subject of sneers and slurs, it having been the fashion of her enemies to reproach her as being a rotten borrough, with other contemptuous names applied to her.

Now, while the decadence of our sister State has, no doubt, been marked and general, it is pleasant to know that it has not become chronic nor yet that the evils complained of are constitutional and incurable. We have it on good authority that a change for the better has recently come over the condition and prospects of Nevada. Her crops of both fruit, hay and grain have the present year been exceptionally good, the latter having been so abundant that after supplying all home wants she will have some breadstuffs to spare. Save in a few places, not much can be raised in that State without irrigation, recourse to which has as yet been had only on a limited scale. But movements have been inaugurated for utilizing more and ultimately all the water available to that end. When this shall have been accomplished, Nevada will be distinguished for the amount and excellence of her cereal products, as good flour having been manufactured from her home-grown wheat as any made in California. The apple, plum and like hardy fruit can also be grown there to perfection, the "Washoe" potato, as we all know, being the very best that has ever found its way to the San Francisco market.

Moreover, there is some improvement visible in the mining industries of Nevada, both on the Comstock lode and in many of the outside districts. More railroads are likely soon to be built, reaching to remote localities suffering now from lack of cheap transportation. The railroad approaching the eastern border of the State from Salt Lake will be of great service to that region, which abounds with mineral wealth of various kinds.

The Growing Cabinet of the State Mining Bureau.

The following mineral specimens, coins, curiosities, etc., were donated to the State Mining Bureau during the month of September last:

Hessite (telluride of silver), Keystone mine, Carson Hill, Calaveras Co., Cal.; H. W. Fairbanks.

Aragonite (car calc), Tolemas Springs, Solano Co., Cal.

Gypsum (hyd. sulph. cal.), near Ravenna, Los Angeles Co., Cal.; J. Robertson.

Gold quartz, Atherton mine, Tioga district, Tuolumne Co., Cal.; E. E. Haft.

Epidote crystal (silicate, etc.), from group of quartz crystals, south side Mt. Hoffman, Mariposa Co., Cal.; Geo. E. Sprague.

Garnet, almandite (silicate, etc.), same locality and donor as last preceding.

Antimony ore (stibnite), Greenhorn Creek, Kern Co., Cal.; A. Blanc.

Copper, native, in quartz with melaconite, Satellite mine, Calaveras Co., Cal.; J. Z. Davis.

Asbestos (silicate, etc.), American Excelsior Consol mine, Goodyear's Bar, Sierra Co., Cal.; Robert Stuart.

Indian stone ring, Santa Catalina Island, Los Angeles Co., Cal.; Benj. Hill.

Pilinite (hyd. silicate of aluminum, calcium and lithium), New Almaden mine, Santa Clara Co., Cal.; J. B. Randol.

Mineral paint (hematite), Santa Rosa, Sonoma Co., Cal.; A. W. Dana.

Quartz, showing free gold, Cerros Island, Mexico; Mrs. C. Wilson.

Chromic iron, near Calistoga, Napa Co., Cal.; S. W. Fee.

Iron ore, magnetite, junction of McCloud and Pit rivers, Shasta Co., Cal., large deposit adjoining limestone; Wm. P. Miller.

Fire-clay, Mount Cliff, Sonoma Co., Cal.; S. W. Mayer.

Japanese gold coins, Nishu Kiu; T. Kitsunesaki.

Moonstone, Point de Galle, Ceylon; B. A. de Saba.

Pandermite, Death Valley, Inyo Co., Cal.; R. S. Dunn.

Fiorite, Yellowstone Park, Montana; J. Z. Davis.

Pearl sinter, Yellowstone Park, Montana; J. Z. Davis.

Roofing slate, Kelsey, El Dorado Co., Cal., Jacob Strahle.

Pebbles, rough and polished, Pescadaro Beach, San Mateo Co., Cal.; Sam'l Somenfeld.

Silver ore, Cashier mine, San Bernardino Co., Cal.; Wm. K. Aldersley.

Sapphires and garnets, El Dorado Bar, Montana; Geo. O. Nettleton.

Besides the above there were donated to the Bureau during the past month a large number of mineral specimens of various kinds, some of them of great scientific interest and a few of much intrinsic value, and thus does the magnificent cabinet owned by the people of this State grow month by month and day by day, these voluntary contributions, like the number of visitors to the Bureau, being constantly on the increase. It might be well to remind the public that this collection, which is a museum of curiosities and an art school as well as a scientific cabinet, is open daily, admission being free to all. Our youth should not only be allowed but encouraged to visit the Bureau as containing matter for both instruction and amusement.

All the several kingdoms of nature, the animal, the vegetable and the mineral, are here represented. Not only so, but there can be seen in this vast collection something from each of their various departments. Here, in well-preserved form, deftly mounted and well displayed in handsome cases, are birds of rare and beautiful plumage, monsters of the great deep, and strange fishes that swam in the primitive seas; the remains of gigantic animals, enormous tree growths, hideous reptiles, and other fossils belonging to races and creatures of prehistoric and even early times.

In this cabinet archæology comes in for a share, there being here rare coins both ancient and modern; mummies from the catacombs of Egypt; classic urns and statues; domestic utensils from the excavations of Pompeii and bricks from the tower of Babel. There are casts of all the famous gold nuggets wherever found; Indian relics and meteors, erratic wanderers, shot from far-off worlds that striking our earth have been arrested in their aimless flight through space.

But to name or even indicate in the most general way all that can be seen in this great receptacle calculated to interest both the learned and the unlettered, would require more space than we have at our disposal. Suffice to say, there is here something to gratify all, and the Bureau being so open to every one, should become a place of general resort for both old and young. That its advantages are meeting with wide appreciation is shown by the multitudes that throng the place every day; the attendance being now twice as large as it was only a year or two since.

At the rate the donations have been made of late, Mr. Irelan, the State Mineralogist, will soon find himself crowded for room, nearly all the available space in the vast apartment occupied by the Cabinet being already filled. By the time what room is left shall have been filled, the Legislature will no doubt provide a suitable building for the reception and preservation of this valuable collection and the general uses of the Bureau.

The Columbian Fair.

Satisfactory progress seems now to be making in preparation for the great World's Fair in Chicago. The Commissioners are in continual session this week, and telegrams show that preliminaries are being rapidly arranged. George R. Davis has been chosen director general, and he issued on Tuesday of this week an address which gives official information concerning the enterprise as follows:

By an Act of Congress it is provided that the buildings for the World's Fair shall be dedicated on Oct. 12, 1892, and that the exhibition shall be open to visitors on the first day of May, 1893, and shall close not later than the 30th of October thereafter. Thus we have two years in which to arrange the grounds and erect the buildings, and seven months additional in which to receive and place the exhibits. So far as this country is concerned, the undersigned feels justified in the statement that the presentation of agricultural and stock products will be in every respect superior to any previous exhibition; also, that in inventions the progress of the United States will be indicated in a most remarkable manner. There is also every reason to anticipate exhibits in large numbers from every other nation on the globe, it being estimated by practical experts that the total number of exhibits will not be less than 50,000, divided equally among the United States and all foreign nations.

It is proposed to make this exhibition especially interesting in all that relates to manufactures by the presentation of the most important processes in active operation. In comparison with these will be presented the methods used in other countries for a hundred years past. Already there are indications that nearly every State and Territory in the Union will be fully represented and that large appropriations will be made at the approaching sessions of the different State Legislatures. Circulars and blank applications for space will be forwarded in due season to all intending exhibitors.

No doubt California will be creditably represented at this grand display, as probably she can invoke no more potent agency for the dissemination of knowledge of her unequaled resources and productions. An organization, as previously stated in the PRESS, is now at work to this end, and the Legislature this winter will be called upon to furnish substantial and adequate aid. There seems to be general consent that the California display must be original in design, unique in development and striking in its impression. It will, of course, take time to determine how this can be done and at what outlay. We acknowledge that we have been very favorably impressed with a plan worked out by E. W. Keeler of the State Board of Trade, which is a happy combination of panoramic representation of characteristic California scenery, with display of material products in a way which it seems to us will give the visitor a realizing impression of California's charms and adaptations. No doubt due attention will be given to Mr. Keeler's proposition and to all others which may be presented.

A MEXICAN is in jail at Tucson for cutting timber on the Ft. Thomas Military Reservation.

The Tariff on Imported Lead-Silver Ores.

In the last issue of the PRESS we presented the views of the lead miners and the reasons why they should be protected against the low rate of wages paid to miners in Mexico. As stated in the concluding paragraph of that article, we this week present the views of the smelters who require the class of ores obtained from Mexico and of those who desire cheap lead and therefore favor the free importation of these ores, for which reason they oppose the new tariff. A great many miners say these parties produce ores chiefly valuable for silver, but which contain a small percentage of lead—not enough, however, for a flux. There is also a large class of ores carrying both gold and silver which require to be reduced by the smelting process, but which are so deficient in lead that from 18 to 20 per cent of this metal must be added in order to reduce them successfully by that process. In other words, the best results are obtained by adding to ores deficient in lead others carrying an excess of that metal. For this reason ores carrying 40 per cent or more of lead are especially desirable for the smelting companies, as to each ton of these may be added a ton of ore which contains no lead. Probably more than one-half of the ores treated by the smelting process are deficient in lead; these can, therefore, be treated most economically and the lead ores most profitably by being combined and smelted together. The presence of iron and lime is also necessary as a flux, and the fact that these various substances are seldom combined in one mine has led to the establishment of large smelting plants located at points central to mining districts, where ores can be sent and sold by the producer. As these smelting companies will buy ores in any quantity and of any grade, so long as they contain value enough to pay cost of treatment, they are of the greatest service to the miner, enabling him to ship a carload of ore or even less and thus realize on the product of his mine from the start. That ores carrying a high per cent of lead are not always available to the smelting companies is clearly proven by the fact that they will give a net price for them much nearer their assay value than for "dry ores," or ores carrying little or no lead. The price of lead has recently advanced two cents per pound for no other apparent reason than that lead which has heretofore come into the country in silver ores free of duty now pays a duty of 1½ cents per pound. This will probably make no difference to the smelting companies. It will, however, to the miner, who will have to pay this tax in the form of an increased charge for the treatment of his ores which carry no lead. If this latter class exceed in number the lead-miners, then this new tariff is a mistake, viewed only from a standpoint of the greatest good to the greatest number engaged in the mining industry.

The smelters say they have invested large sums in the construction of reduction works, locating their plant in many instances with reference to facility for obtaining this class of ores from Mexico, and that to now practically exclude these ores must work them a great hardship, some of the parties so complaining hinting at the possibility of their transferring their plant to the Mexican side of the line if relief is denied them.

If this tariff is to be maintained they affect to believe there will not only grow up a great smelting industry in our sister Republic, but that the latter may be provoked to legislate to the prejudice of both this and other of our industrial pursuits.

Salt-Making Processes.

NUMBER 1.

We make many thousands of tons of salt in California every year, altogether from the evaporation of the salt waters of the bay. We have described the methods employed here in previous numbers of the PRESS. Mr. Thos. M. Chatard, of the U. S. Geological Survey, has written a monograph on the "Salt-Making Processes" of the United States, and we have reproduced some of the engravings from his work. In examining and comparing the different processes we shall find that they fall into three groups, according to the character of the heat employed and the mode of application: (1) Use of solar heat, or solar salt manufacture; (2) direct artificial heat, or kettle and pan processes; (3) steam heat, or graduer methods.

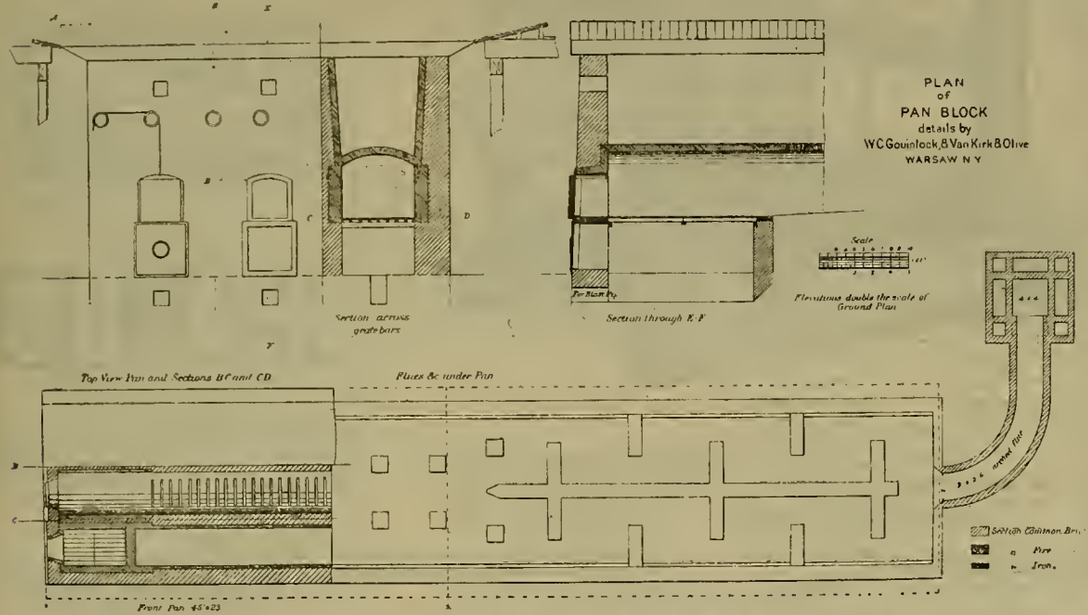


Fig. 1.—PLAN OF PAN BLOCK FOR MAKING SALT.

The pan process, long known in Europe, was introduced in Syracuse, N. Y., in 1852, but was soon abandoned, although there is no reason, considering the composition of the brine, why proper arrangements should fail to give good results. In other sections pans are extensively used, and Fig. 1 represents the usual form. The pan is 100 feet long, 23 feet wide, and 10 inches deep, and is divided by a cross-partition into the front pan, 45 feet long, and the back pan 55 feet. The sides of the pan incline outward and meet the draining boards which extend along the sides. The foundations are of stones, the furnace walls of common brick with linings and arches of firebrick. A forced draught, supplied by a rotary blower, is used, and the fuel is anthracite slack burned on a perforated grate. The dimensions and other details are indicated in Fig. 1, made from sketches and information kindly furnished by Dr. W. C. Gouinlock and Messrs. Van Kirk & Olive, of Warsaw, N. Y.

In some cases the grates are put in on an incline, the back being the higher part, and the arch is made much shorter than in the drawing, say 10 feet. Bridge walls are also used, but in most cases are absent. The pans are made of one-fourth inch boiler iron, riveted and calked, and are supported by the outside walls, by the division walls between the fires for a certain distance, and beyond that, by piers succeeded by a system of deflecting walls designed to effect a more thorough utilization of the heat. The fire gases pass to the stack, which is intended to be used for two pans and is placed midway between them. Where the pan is divided into front and back pans, as in the drawing, the brine is brought to complete saturation in the back pan, depositing a portion of the sulphate of lime and then passing into the front pan, where the salt is made, usually at boiling heat (220° F. = 105° C.).

Another arrangement of flues is that in which two fires are used for each pan, the division wall between them running the entire length of the pan. On either side of the central wall, midway between it and the side walls, is a wall running parallel with it and extending from the front wall to within a short distance of the rear wall, making two sets of two flues each. At the front ends of the two central flues are the fires, the fire gases passing along the central flues to the end of the pan and returning by the outside flues to the front. In this arrangement the stack is at the front.

For a Text.

Taking for a text the fact that two-dollar auriferous quartz can now be mined and milled in California at a profit, an interesting sermon might be preached therefrom on the possibilities of gold mining in this State. When we commenced this branch of mining in California, quartz carrying free gold to the value of $50 per ton was considered about as low-grade ore as we could then afford to handle, $30 rock being thrown aside as utterly worthless.

So costly then were labor and the other factors of production, so imperfect our machinery and methods, and such our ignorance of the business, that after we had followed quartz mining for a few years, much money having been spent in the interim to promote it, this industry, instead of growing and prospering as was expected, actually went into a decline, and for a long succession of years idle quartz-mills and abandoned mines were to be seen all over California.

But at length there came a change; not marked or rapid at first, but a change that in good time served to restore life to this business and finally insure for it a lasting and cumulative prosperity.

Vast and diversified are the material resources of California. Boundless the opportunities presented here for the profitable employment of capital and labor. All our leading home pursuits are destined to undergo early and rapid expansion. There can be no doubt of this. We have already entered on this the stage of our second growth. But on none of these domestic industries does there await such phenomenal growth as that reserved for the business of quartz mining. It is the one thing in which we have the raw material without stint, unexampled facilities for its prosecution and that cannot be overdone.

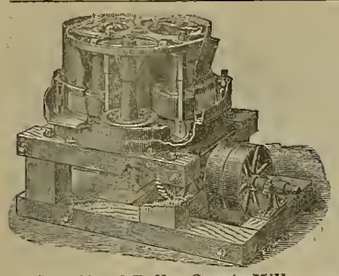
Who can measure the two-dollar per ton gold-bearing quartz to be found in this State? Who can measure even the extent of our auriferous territory? We know our principal gold belt covers an area of 20,000 square miles or more, besides which we have several minor gold-fields whose aggregate area is nearly half as large. We know this whole territory abounds with auriferous quartz veins, but we know little about their extent because not one in a hundred has yet been exploited to any great depth. A hundred years hence we will be better informed on this point. About that time our people, more fully advised as to the extent of our auriferous wealth, will be wondering why we of the present generation were so seemingly indifferent to its existence and so slow to turn it to practical account.

THE brick war in New York has come to an end. Since July it has seriously curtailed the manufacture of brick and materially impeded building operations.

THE Pacific Electrical Storage Company has closed a contract for a 600 light plant for the Hotel Pleasanton, on Sutter street, in this city.

THE Illinois State Fair opened last week at Peoria with an attendance of 75,000 persons, 38,000 strangers being present.

THE works operating on the shore of Owen's Lake, Inyo county, are turning out large quantities of soda.



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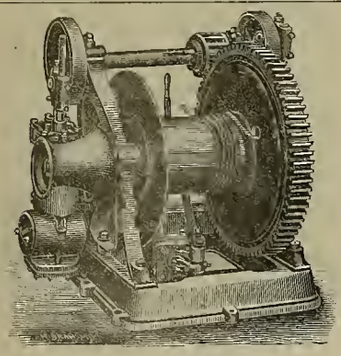

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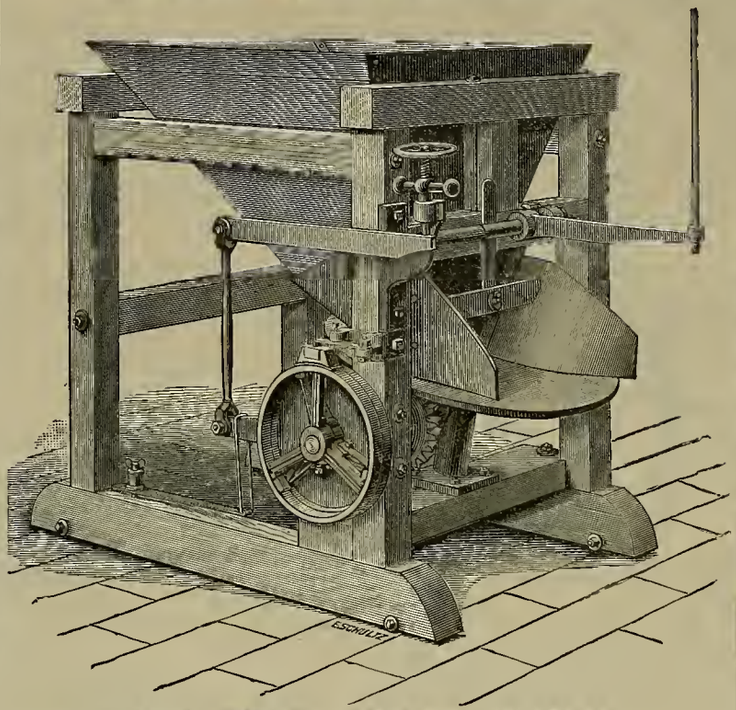

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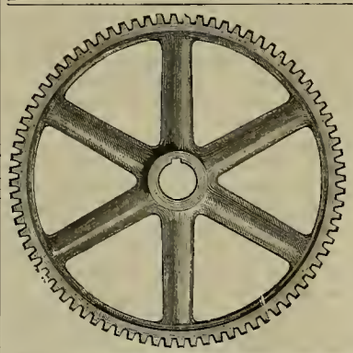

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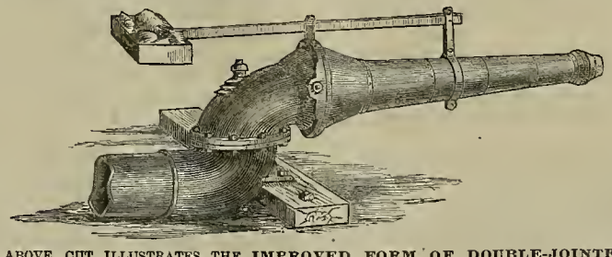

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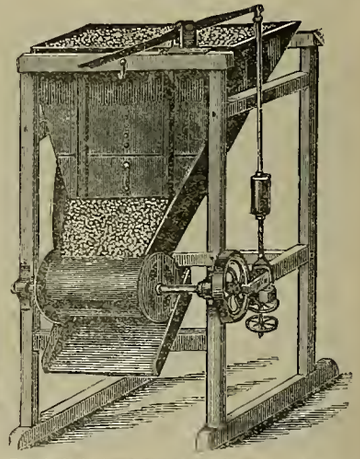

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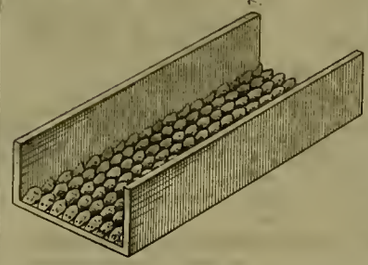

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Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working samples, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles Smelting, Mexican process, Chilean process, Krochinke's process, etc. Under "Pulverizing Machines" are described leaching arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

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Assessment Notices.

GOULD & CURRY SILVER MINING Company.—Location of principal place of business, San Francisco, California; location of works, Virginia, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Trustees, held on the 16th day of September, 1890, an assessment (No. 65) of Thirty Cents (30c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, room 69 Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of October, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on THURSDAY, the 13th day of November, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Trustees.
ALFRED K. DURBROW, Secretary.
Office—Room No. 69 Nevada Block, No. 309 Montgomery Street, San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 19) levied on the 25th day of August, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Buffington, J M, Trustee	406	500	$ 30 00
Barrows, Albert	355	600	36 00
" "	357	271	16 26
" "	420	700	42 00
Bogart, O H, Trustee	473	214	12 84
" " "	488	105	6 30
Bowers, D	379	20	1 20
" "	404	500	30 00
Francis, H L, Trustee	280	300	18 00
" " "	444	1,500	90 00
Nash, H W	260	104	0 24
Rosekrans, H M	30	600	36 00
Stout, Mrs M E	170	500	30 00
" "	188	500	30 00
Stout, C S, Trustee	476	2,000	120 00
" "	477	953	57 18
Searles, W A, Trustee	518	1,000	60 00
Stetson, A M, Trustee	520	5,000	300 00
Taylor, J N, Trustee	532	1,040	62 40

And in accordance with law, and an order of the Board of Directors, made on the 25th day of August, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on MONDAY, the 20th day of October, 1890, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

A. W. BARROWS, Secretary pro tem.
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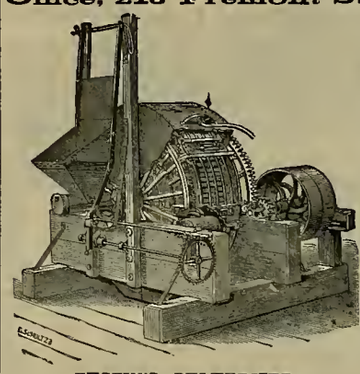

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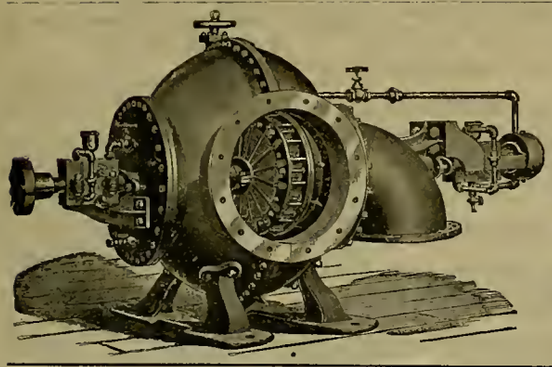

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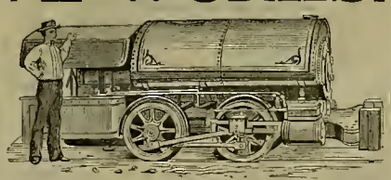

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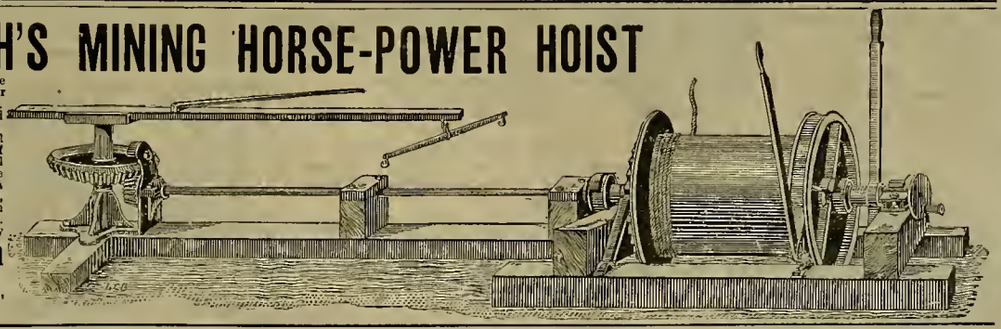

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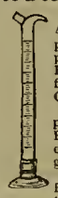

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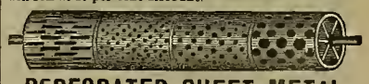

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 16, 1890.

The past week has witnessed contioued activity in all lines of trade. Those branches which are affected by the higher duties were the most active. The local money market is fairly easy. The demand is slow, and no increase is looked for until after election.

MEXICAN DOLLARS—The market is dull at 85 to 86 cts.

SILVER—After a silence of about two weeks, the Treasury is making the silver purchases public. The purchases on yesterday were telegraphed as follows: The amount of silver offered for sale to the Treasury to-day was 436,000 ounces, and the amount purchased 275,000 ounces, as follows: 75,000 ounces at $1.0959, and 200,000 ounces at $1.0969. The Mint's counter rate to this city has been $1.09¾ per ounce. To-day New York and London telegrams report public quoted prices for silver slightly higher —$1.09 in New York and 49¾d in London. In our market very little silver is offering—held for expected better prices later on. All that is being sold is done so under pressure.

QUICKSILVER—Receipts the past week aggregate 224 flasks domestic and 100 flasks from London. The exports by sea aggregate 30 flasks to Mexico. The market is steady, with a continued fair demand reported.

BORAX—Receipts aggregate the past week 258 ctls. The market is reported firm under improved advices from the East.

LIME—Receipts aggregate 2577 hhls. the past week, and exports by sea 100 hhls. to Honolulu. The market is quiet but steady.

ANTIMONY—The market is easy. New York advices report an easier market.

LEAD—The market is very stiff at full quotations. New York advices report a firm, strong market at 5¾ to 5⅞ cts., with now and then 6 cts. paid. The demand is said to be fair, while the holding is strong.

IRON—The market is steady under a fair quantity being taken by foundrymen and others. Compared with last year, it is said that more is going into consumption.

TIN—The market is strong for plate at an advance, due to the tariff, but weak for pig, due to its coming in free of duty. The demand is slow. European advices, while reporting the market more or less unsettled, give a healthy tone.

COKE—Imports by sea the past week aggregate 200 tons from Swansea. The market is firm for spot.

COPPER—Exports the past week aggregate as follows: Honolulu, 746 lbs.; Mexico, 1570. The market is reported firm. At the East, contract sales are reported of Lake at 17 cts. for the remainder of the year. Some straggling parcels are being picked up at 16¾ cts. The general tone to the market is healthy, notwithstanding light business.

COAL—Imports the past week aggregate as follows: Nanaimo, 3692 tons; Seattle, 4529; Newcastle, N. S. W., 1805; Swansea, 1597; Philadelphia, 100; New York, 112; total, 11,835 tons.

The coal market for both spot, to arrive and for loading is very stiff, with an advance obtainable for some kinds. The demand is quite active for steam, gas and household coals. The supply on hand is light, as is that to arrive. Australian advices report the strike still on.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, October 16, 1890.

ANTIMONY	— @ 21½
BORAX—Refined, in carload lots	8 @ —
Powdered " " "	8 @ —
Concentrated " " "	7¼@ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheathing	23 @ 25
Ingot, jobbing	20 @ —
do, wholesale	19 @ 19½
Fire Box Sheets	23 @ 25
LEAD—Pig	6 @ 6¼
Bar	6¾@ —
Sheet	7¼@ —
Pipe	7 @ —
Shot, discount 10% on 500 bags Drop, ₱ bag	1 90 @ —
Buck, ₱ bag	2 10 @ —
Ohillei, do	2 30 @ —
QUICKSILVER—By the flask	56 00 @56 50
Flasks, new	— @ —
Flasks, old	54 @ 55
TINPLATE—B. V., steel grade, 14x20, to arrive	@ —
B. V., steel grade, 14x20, spot	6 12½@ 6 25
Charcoal, 14x20	6 50 @ —
do roofing, 14x20	6 00 @ —
do, do, 20x28	13 00 @ —
Pig tin, spot, ₱ lb., nominal	23@ 24
CHROME IRON ORE, ₱ ton	19 00 @ —
IRON—Bar, base	3 @ 3½
Norway, base	4½@ 5½
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —

IRON—Glengarnock ton	Spot. 34 00 @ —	To Load. 30 @ —
Eglinton, ton	34 00 @ —	30 @ —
American Soft, No. 1, ton	— @32 00	33 @ —
Oregon Pig, ton	— @33 00	— @ —
Puget Sound	34 00 @ —	— @ —
Bar Iron (base price) ₱ lb	— @ —	— @ —
Clay Lane White	— @28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Langloan	34 00 @ —	30 @ —
Thorncliffe	34 00 @ —	30 @ —
Gartsherrie	34 00 @ —	30 @ —
Barrow	34 00 @ —	30 @ —
Thomas	33 00 @ —	— @ —
Cargofleet	30 00 @ —	26 @ —

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO. AM'T.	LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alki Cons M Co	California	1	1..Aug 28	Oct 3	Oct 22	B B Keeler	Flood Building
Alpha Cons M Co	Nevada	5	25..Sept 16	Oct 22	Nov 11	O E Elliott	309 Montgomery St
A ta M Co	Nevada	39	19..Sept 1	Oct 7	Oct 29	L Osborn	309 Montgomery St
Baker Divide & M Co	California	18	20	Nov 17	Dec 8	D M Kent	330 Pine St
Challenge Con M Co	Nevada	7	50..Sept 26	Oct 28	Nov 17	O L McCoy	331 Pine St
Coleta M Co	California	1	10..Sept 16	Oct 27	Nov 24	D M Kent	330 Pine St
Gray Eagle M Co	California	19	6..Aug 25	Sept 29	Oct 20	J M Buffington	303 California St
Gould & Curry S M Co	Nevada	65	30..Sept 16	Oct 21	Nov 13	A K Durbrow	309 Montgomery St
Hale & Norcross M Co	Nevada	96	50..Oct 7	Nov 12	Dec 3	A E Thompson	309 Montgomery St
Humboldt M & M Co	Nevada	1	1..Aug 16	Sept 29	Oct 25	J C Ruddock	35 New Montgomery St
Leigh C avel M Co	California	1	25..Sept 3	Oct 13	Nov 5	E E Fall	320 Pine St
Live Oak Drift Cravel M Co	California	12	5..Sept 3	Oct 9	Oct 31	J Morizio	328 Montgomery St
Mono G M Co	California	30	25..Sept 18	Oct 28	Dec 2	B L Burling	309 Montgomery St
Montecito M Co	California	1	10..Sept 16	Oct 27	Nov 24	D M Kent	330 Pine St
North Peer C & S M Co	Arizona	6	5..Oct 1	Nov 5	Nov 25	Henry Deas	309 Montgomery St
Russell Reduction and M Co	California	7	5	Nov 17	Dec 8	J Morizio	328 Montgomery St
Sterling M Co	California	1	6..Sept 16	Oct 27	Nov 24	D M Kent	330 Pine St
Seg Belcher & Mides Cons Co	Nevada	7	25..Oct 7	Nov 10	Dec 1	E H Holmes	309 Montgomery St
Silv r King M Co	Arizona	4	30..Sept 20	Oct 28	Nov 18	Aug. Waterman	325 Montgomery St
Weldon M Co	Arizona	3	10..Sept 3	Oct 9	Oct 30	A Waterman	309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	Annual	Oct 20
Exchequer M Co	Nevada	C E Elliott	309 Montgomery St	Annual	Oct 20
May Flower G M Co	California	J Morizio	328 Montgomery St	Annual	Oct 20
Silver West Cons M Co		F R Bunker	628 Montgomery St	Annual	Oct 21
Valley View M Co		W J Garnett	308 Pine St	Annual	Oct 20

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Cale	309 Montgomery St	25	Aug 22
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	April 10
Derbec Blue Gravel M Co	California	T Wetzel	622 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California		Grass Valley	2 50	Mar 7
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Oct 10

Mining Share Market.

The market the past week dragged at fairly unchanged prices up to yesterday, when a weaker tone set in under a hear raid by inside brokers offering small quantities, 5 to 20 shares, of Savage and Chollar at reduced prices. This had the effect to bring in outside sellers whose stocks were quickly taken. This (Thursday) morning the market opened weak for the middle aod north end shares, which was followed by a slight shading in prices after hoard. The manipulation shows on its face to have been done for the purpose of uncovering margined stock, and also bringing in cash sellers. For the points, the past three weeks have been "break," "break," but every share offered was readily taken. Some fair-sized blocks ranging from 500 to 1000 shares found buyers without breaking prices. It now looks as if the shading off to-day is the first move for an up market, based on stocks well in hand, important work in the mines and a certainty of development soon.

In outside stocks there is a strong tone under steady buying orders. Quijotoas show a slight advance, as do the Tuscaroras. The Bodies hang around last week's higbest prices. In the Tuscaroras, North Belle Isle and Belle moved up the most under a reported improvement in the latter mine.

The contest over the control of the Andes mine has received considerable attention, which evidently attracted some notice from the stock market. What the outcome will be it is hard to say. There appears to be a three-cornered fight free to all newcomers.

From the Comstock mines the news is growing more interesting. The crosscuts, particularly to the west, being run by several of the mines, are approaching the important sections from which good results are expected. While many experienced miners do not look for any material change for the better until some time next month, yet there are those who say that a strike is liable to occur any day. An important strike is what is required to start the stock market on a good, solid boom. It is stated that the Comstock Tunnel Co. is likely to commence operations at an early day on the lode. In Sierra Nevada they ought to be near the $30 ore lying to the west. In Best and Belcher the northwest crosscut ought to be near the good milling, running from Con. Virginia. The work going on in Ophir, Savage and Chollar needs close watching. Those in position to know are looking with confidence to good results from the work going on in the Gold Hill mines. The pump is working satisfactorily, but owing to slides or caves in the shaft, slow progress is being made. The Altapump has not started up—perhaps the managers of that group have legal fees to pay so as to absorb the moneys received from assessments, hullion, etc., after which start the pumps up on more assessments. The south drift from the Potosi winze running toward Bullion has been stopped. It was in $15 ore when stopped. Official letters received today from the Gold Hill mines are of the same tenor as noted in last week's issue.

From the outside mines our advices report continued good news from the Quijotoas. From the Tuscaroras a decided improvement is reported in North Belle Isle, and highly encouraging prospects of improvements in two or three other mines. From the Bodies our advices are confirmatory of a decided improvement in the Bodie in the winze below the 700-foot level. Our correspondent is very sanguine of the best results from the enlarging work now going on. More miners are being put to work. The official letter from the mine reports the mill working satisfactorily. Some rich ore is being taken out. The Standard mill is running satisfactorily and on good ore. In the Silver King mine, Arizona, an important strike is reported.

Eastern Metal Markets.

By Telegraph.

NEW YORK, October 16.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	49½	1 10½	$16 75	$5 90	$23 00
Friday	50	1 10	16 75	5 90	23 00
Saturday	50	1 10½	16 75	5 90	23 00
Monday	50	1 10	16 75	6 00	23 00
Tuesday	49¾	1 09½	16 75	5 90	23 00
Wednesday	49¾	1 08¾	16 75	6 00	21 35

NEW YORK, October 14.—Quicksilver is firm at 79@82c. Concentrated Bnrax is scarce. California refined and powdered, 9½@9¾c. Large contracts are reported in Lake Copper during the remainder of the year at 17c. Arizona is easier at 16½c; casting 14½@14¾c. Pig Lead is scarce on domestic, and the absorbed foreign caused a strong upward tending in prices. Carload lots sold at $5.76@5.90. For small lots $6 is asked.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 7, 1890.

437,766.—GATE—J. A. Bacon, Phœnix, A. T.

438,062.—SAWMILL SET WORKS—E. T. Davies, Portland, Or.

437,888.—HARNESS TOOL—Henry Eghers, S. F.

437,984.—BURGLAR ALARM FOR CLOCKS—C. O. Farciot, S. F.

437,890.—HOSE-COUPLING—A. T. Gilhert, Salem, Or.

437,891.—GRAIN-CLEANER—John Grider, La Grange, Cal.

437,895.—BASEMENT, ETC., CONSTRUCTION—P. H. Jackson, S. F.

437,903.—SAFETY POCKET—E. Jacohs, Petaluma, Cal.

437,834.—VEHICLE BRAKE—W. H. Kaseberg, Wasco, Ogn.

437,862.—PLASTERERS' TOOL—Kelly & Williams, S. F.

438,085.—VALVE GEAR—F. S. McKibhen, Joseph, Or.

437,865.—OIL CAN—P. J. Moore, S. F.

438,016.—DISPLAY BOTTLE—T. H. Palmer, San Bernardino, Cal.

437,717.—DEVICE FOR TRANSMITTING MOTION—C. A. Palmquist, Spokane Falls, Wash.

437,871.—PIPE MACHINE—F. M. Speed, S. F.

437,945.—LATHE ATTACHMENT—W. Swahel, S. F.

437,875.—CONCENTRATOR—C. W. Tremain, Portland, Or.

437,878.—HAT-FASTENER—P. N. Tryon, S. F.

437,805.—BARBED WIRE—W. T. Walton, Mayville, Or.

438,126.—MOUNTING GLOBES—M. Wheeler, S. F.

437,879.—SCHOOL RULER—W. H. H. Wright, S. F.

The following brief list by telegraph for Oct. 14, will appear more complete on receipt of mail advices:

California—Mablon K. Biser, Los Angeles, washing machine; Nelson Giles, Jr., and L. E. and W. E. Brown, National City, insecticide; John Hander, S. F., fly paper; Ellsworth D. Middlskauff, Stockton, churn; James M. Miller, Vacaville, verge wire for clocks; James R. Phelps, Sacramento, harness; John M. Pray (assignor of one-half to H. H Liethead), Los Angeles, pipe-tongs; Joseph F. Prizgent, Los Angeles, shirt-measuring appliance; George C. Richards (assignor of one-half to W. T. Tuckwell), Sisson, tire-tightener; John C. Shelley, Stockton, cable railway; Thomas W. C. Spenner, S. F., automatic throw-off for cable-grips.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SCHOOL RULER.—Wm. H. H. Wright, S. F., Cal., assignor of one-half to Thomas E. Johnson of San Jose, Cal. No. 437,879. Dated Oct. 7, 1890. This ruler is designed for use in schools, and is constructed to conveniently contain such necessary adjuncts as pens, pencils, a sponge, a pincushion, a slate rag, etc. The ruler is a hollow cylindrical one, preferably formed of a piece of sheet metal, one of the edges of which is extended to form a concavo-convex portion, the edge of which serves to rule by; the ruler is provided with a concentrically turning compartment or casing fitted within it and having an open front, which is exposed when turned to the front and closed when turned to the back. This casing is to contain the pens, pencils, etc. In the open ends of the ruler are fitted sleeves which carry the sponge, the pincushion and the slate rag.

HARNESS TOOL.—Henry Eghers, S. F. No. 437,888. Dated Oct. 7, 1890. This tool belongs to the general class of combination tools, but is especially adapted for use in connection with the handling of leather and articles and apparatus made therefrom. It will he found useful in repairing harness, belting, and in riveting and lace-cutting. The instrument combines a series of different sized punches, which are carried in the hack of one of the jaws, and each can be readily taken out and placed in position to operate; a rivet-cutter between the two jaws, a strip cutter with guard and gauge on the body of the tool, an awl formed by the sharpened end of one handle, an anvil carried in the end of the other handle, and a hammer formed on the hack of one of the jaws.

HAT-FASTENER.—Philo N. Tryon, S. F. No. 437,878. Dated Oct. 7, 1890. This is a fastener or securing ladies' hats upon their heads. It consists of a plate having a spring hinge clasping a securing pin whereby the plate is secured to the hat, said plate having perforations through which two pronged pins fit and has a sliding movement to penetrate the hair. The device is located heneath the rim of the hat, out of the way.

PIPE MACHINE,—Francis M. Speed, S. F. No. 437,871. Dated Oct. 7, 1890. This machine is applicable to the manufacture of pipe from material which is first made plastic by heat, aud which afterward solidifies. Its principle is the displacement of the material within a mold, by a moving plunger. It consists of a closed cylinder having a pressure head, a plunger within the cylinder, and means for moving the plunger whereby the material within the cylinder will he displaced upwardly about the plunger and will he compressed by the pressure head.

HOSE-COUPLING.—Andrew T. Gilhert, Salem, Oregon. No. 437,890. Dated Oct. 7, 1890. The object of this device is to provide a simple and effective coupling which will admit of its ready connection to join two pieces of hose, or to connect the hose with the hydrant. It consists of two opposing pipes having heads, one of which fits into the other, engaging lugs on one side of the heads, and a swinging link and hook with which it engages on the other side of the heads, said link being carried by and tightened hy an eccentric headed lever pivoted to one of the pipe heads.

GRAIN-CLEANER ATTACHMENT.—John Grider, La Grange, Cal. No. 437,891. Dated Oct. 7, 1890. This attachment is adapted lor use on any grain-cleaner or separator; but it is especially applicable to traveling harvesters. It consists of laterally moving rakes suspended above the cleaning shoe, and mechanism for operating them, so as to throw the chaff and straw toward the center of the shoe and prevent its filling up and accumulating upon the sides. Thus a perfect cleaning is effected, hy the distribution of the material evenly over the surface of the shoe.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Sept. 25.		WEEK ENDING Oct 2.		WEEK ENDING Oct. 9.		WEEK ENDING Oct. 16.	
Alpha	1 20	1.75	1.65	1.85	1.50	1 75	1.55	1.80
Alta	1.15	1 30	1.00	1.20	1.55	1.70	1 55	1.65
Andes	2.05	2.85	2.25	2.85	2.25	2.55	2.30	2.80
Belcher	3.30	3 40	3.75	3.40	3.15	3 40	3.25	3.35
Best & Belcher	3.25	*3.80	3 75	3.95	3 60	3 85	3.60	3.85
Bullion	2.75	2.85	2.80	2.95	2.75	3.70	3.40	3.75
Bodie Con	1.20	1 75	1.40	1.75	1.45	1.65	1.70	1.95
Bulwer	.30	....	.30	....	.25	....	.25	.35
Commonwealth	2.75	....	2.50	....	2.75	....	....	....
Con. Va. & Cal	4.80	4.85	4 75	4.90	4.75	4 90	4.75	4.85
Challenge	2.60	2.8	2.55	3.10	2.50	2 9	2.65	2.75
Chollar	3 25	3.40	3 20	3.40	3.15	3.75	3.45	3.75
Confidence	6.75	7 5	7.00	8.00	7.00	7.75	7.50	....
Con. Imperial	.40	.41	.40	.45	.41	.45	.35	.35
Caledonia	.55	.15	.55	.6	.55	.60	.55	.60
Crown Point	2.90	3 10	2.75	3.00	2.70	2.9	2.8	3.00
Crocker	.30	....	.25	....	.30	....	.30	....
Del Monte	1.00	....	....	....	.80	....	.75	....
Eureka Con	4.25	....	4.25	....	4.25	....	4.20	4.25
Exchequer	1 05	1.25	1.20	1.30	1.15	1.50	1.40	1.60
Grand Prize	.35	.40	.40	....	....	....	....	....
Gould & Curry	2 15	2.25	2.25	2.30	2.20	....	2.29	2.35
Hale & Norcross	2.35	2.45	2.35	2.45	2.20	2.40	2.10	2.25
Julia	.35	....	.35	....	.30	.3	.30	.35
Justice	1 60	1.55	1.50	1.60	1.40	1.66	1.56	....
Kentuck	1.70	*1.90	1.65	1.8	1.60	1.85	1.81	2.35
Lady Wash	.55	.75	.60	....	.60	....	.60	.65
Mono	.40	.70	.55	.60	.65	....	.60	.75
Mexican	3 20	3.3	3.5	3.60	3.40	3.6	3.30	3.40
Navajo	.45	.50	....	.50	....	.35	....	....
North Belle Isle	1.45	1.25	1.10	....	1.00	1.05	1.05	1.45
Nev. Queen	.85	.95	.90	.75	....	.90	....	....
Occidental	1.90	2.30	2.00	2.30	1.95	2.15	1.90	2.00
Ophir	4.90	5.25	5.00	5.25	5.00	5.25	5.00	5.37
Overman	2 20	2 3	2.15	2.3	2.25	2.45	2.35	2 45
Potosi	6.87	7.12	6.25	7.10	6.75	7.62	7.25	7.75
Peerless	.25	.30	....	....	.25	....	.25	.30
Peer	.25	....	.20	....	.20	.25	.25	.30
Savage	3.60	3.80	3 70	3 9	3 65	3.75	3 40	3.70
S. B. & M	1.55	1.65	1 50	1.70	1 5	1.60	1.45	1.60
Sierra Nevada	2.85	3.00	2 90	3.25	2 90	3.10	3 10	3.45
Silver Hill	.40	.45	.30	.40	.30	.35	.25	.30
Scorpion	.30	....	.30	....	.25	....	.30	....
Union Con	2 95	3.0	2.90	3.15	2.85	3.0	2.90	3.30
Utah	1.10	1 20	1.10	1.25	1.10	1.20	1.15	1.35
Yellow Jacket	3.40	3.50	3 35	3.50	3.35	3.50	3 35	3 60

* Assessment delinquent.

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 16, 9:30 A.M.

250	Alpha Con	1.55	
500	Andes	2.35	
100	Belle Isle	1.00	
150	Bodie	1.90	
550	Bullion	3.55	
100	Challenge Con	2.60	
300	Chollar	3.50	
100	Con. Cal. & Va	4 70	
20	Confidence	7.00	
250	Crown Point	2 90	@2.95
240	Exchequer	1.35	@1.40
350	Gould & Curry	2.15	
150	Kentuck	2 05	
100	Keyes		5c
250	Mexican		3.30
50	Mono		70c
200	North Belle Isle		1.35
500	Ophir		5.00
400	Overman		2.35
150	Potosi	7.12½	@7 25
350	Savage		3.25
100	Peg. Belcher		1.50
250	Sierra Nevada		3.20
125	Union Con		3.05
200	Utah		1.20@1.25
100	West Comstock		50c
200	Yellow Jacket		3.35

Coal.

SPOT FROM YARD—PER TON		TO LOAD—PER TON.	
Wellington	$10 00	Australian	$ 9 00@—
Greta	12 50	Liverpool St'm.	8 50@—
Carbon Hill	8 00	Scotch Splint	8 60@ 9 00
Nanaimo	10 00	Cardiff	8 50@—
Gilman	9 00	Lehigh Lump	16 50@17 00
Seattle	9 00	Cumberland bk	18 50@—
Coos Bay	9 00	Egg, hard	16 00@—
Cannel	None		
Egg, hard	16 00	**Coke—English.**	
Cumberland, in sacks	17 00		
do, bulk	16 00	To load	$12 00@13 00
Wallsend	12 00@12 50	Spot, in bulk	16 00@18 00

Successful Patent Solicitors.

As Dewey & Co have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, le evidanced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

The Pittsburgh Boiler Scale Resolvent.

☞This Resolvent IS NOT AN EXPERIMENT but a FACT, and it will do the work claimed for it at a LESS EXPENSE than any other boiler purge, AND IN NO MANNER INJURE THE IRON.

CARNAGIA BROTHERS & CO., PROPRIETORS OF EDGAR THOMSON STEEL WORKS, PITTSBURGH, PA. WORKS AT BRADDOCK. Oct. 4, 1887.

We use the Pittsburgh "Boiler Scale Resolvent," and are well satisfied with the results obtained. We have tested nearly all Compounds presented to us, and this one is **the only good thing we have ever used.** Our feed-water is heated in Berryman Heaters, but owing to distance of heaters from boilers, we rarely exceed 150 degrees of heat in feed-water.

Our water is of the worst character, containing such bad impurities as **sulphate of lime, carbonate of lime, mud, and everything that is bad.** Very truly yours, WM. R. JONES, Gen. Supt.

No water in the United States produces scale in greater quantity or of a harder nature than the Monongahela River, containing SULPHATE and CARBONATE of lime, iron, MAGNESIA, SILICATE, SULPHUR, ALUMINUM, etc. The following well-known manufacturers, who are large steam users IN PITTSBURGH, and using the water from said river as boiler-feed for all their boilers, USE THIS RESOLVENT in their steam plant, and to whom reference is hereby made: Carnegie Brothers & Co., Proprietors of the Edgar Thomson Steel Works; Dilworth, Porter & Co.'s Spike Works; and Oliver and Robert's Wire Co.; and many other firms in the great manufacturing center WHERE THE RESOLVENT IS MADE. Reference is also given to Robert McMahon, Boiler Inspector for Allegheny Co., Penn., and to the following Railway Companies who use it on their locomotives: Kansas City, Fort Scott & Gulf Railroad; Central Iowa; Mexican Central; Delaware, Lackawanna & Western; Burlington, Cedar Rapids & Northern, Terre Haute & Indianapolis; Mexican National; and Denver & Rio Grande Western.

Upon receipt of order, WITH THE PROMISE OF FAITHFULLY CARRYING OUT THE PRINTED DIRECTIONS, we will furnish, FOR FIRST INTRODUCTION, a Barrel, or Half Barrel, of the Resolvent, and the invoice will bear the following stamp:

{ TO BE PAID FOR WHEN RESOLVENT PROVES ENTIRELY SATISFACTORY. }

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Dealers in Improved Wood-Working Machinery

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Sole Agents for Hoe Chisel-Tooth Saw, Gardner Governor, Schultz Leather Belting, Etc., Etc.

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☞If in want of Machinery of any description, write us for Descriptive Circulars and Prices.

Rock Drilling and Air Compressing Machinery

For TUNNELS, QUARRIES, MINES, RAILROADS

And Wherever Ore and Rock are to be Drilled and Blasted.

☞ SEND FOR NEW CATALOGUE OF 1889. ☜

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Superior to all Others for Quartz Mills, Smelters, &c.

Not Affected by Wet, Steam, Heat or Oils. Every Belt Guaranteed. Try It. Send for Circular and Samples.

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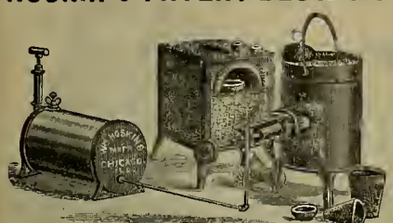
HOSKIN'S PATENT BLOW-PIPE AND ASSAY FURNACES.



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Chemists, Assayers, Metallurgists, Engineers, Jewelers, Dentists, Etc.

NO DUST! NO ASHES!

Portable! Practical! Automatic! Economical!

Will do for every thing that a Coal Furnace or Gas Furnace will, and WITHOUT A BLOWER.

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THE "VULCAN" ICE & REFRIGERATING MACHINERY

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BREWERIES,
PACKING HOUSES,
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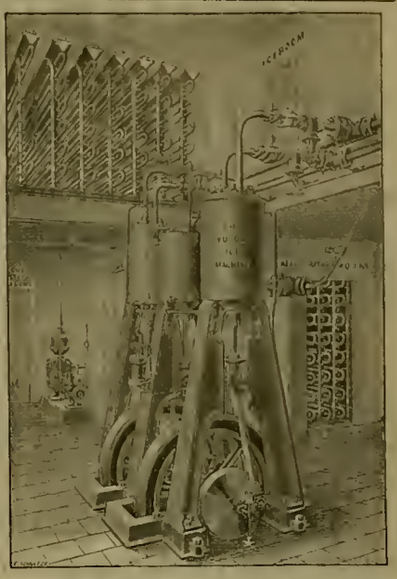
COLD STORAGE,
FRUIT STORAGE,
CREAMERIES.



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The 25-ton Refrigerating Machine has been running continuously since 1887 and has proved economical and satisfactory in every respect.

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The "Vulcan" Ice and Refrigerating Plant is satisfactory in every respect, " " " " a model of good workmanship. The Ice is clear.

CHAPMAN AMMONIA VALVES.
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— MANUFACTURERS OF —

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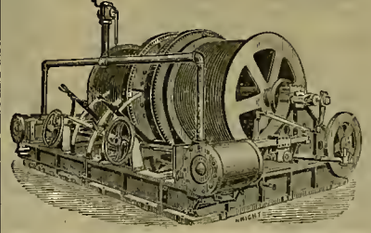

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For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

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SQUARE FLAX PACKING,

Manufactured from strictly first-class Flax and pure lubricants. Superior to all others for water and steam. Packs with less friction and makes a tighter joint than any other packing made. ☞ Imitations of inferior quality having been put upon the market, we have been compelled to adopt the above trade-mark, and all of our packing will now have a RED CORD running through the center its entire length. See that you get it and take no other. Sold by all Hardware dealers. Price, 50 cents per pound. **W. T. Y. SCHENCK,** Sole Manufacturer, 222 and 224 Market Street, San Francisco, Cal.

ADAMANTINE SHOES & DIES FOR STAMP MILLS.

These SHOES and DIES are in extensive use in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited, subject to above conditions.

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H. D. MORRIS, Agent,
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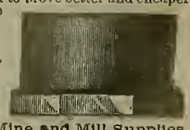

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MINING, MILL and GENERAL MACHINERY.

ENGINES, BOILERS, STEAM PUMPS,
AIR COMPRESSORS, ROCK DRILLS,
WALL'S CRUSHING ROLLS,
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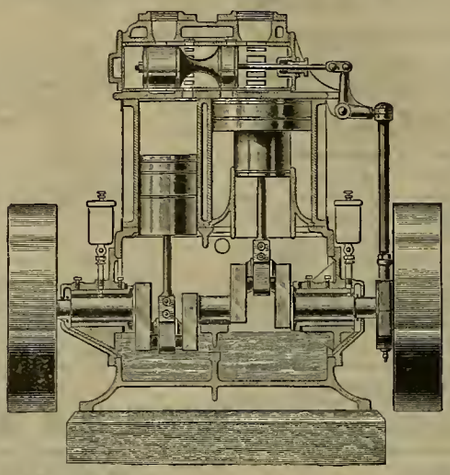
GOLDEN GATE CONCENTRATORS,
GREATEST CAPACITY OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps.



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ROTARY PUMPS, GANG EDGERS,
CAMPBELL'S STEAM FEEDS,
MILL and MINE SUPPLIES.

GENERAL AGENTS FOR

WESTINGHOUSE AUTOMATIC ENGINES.

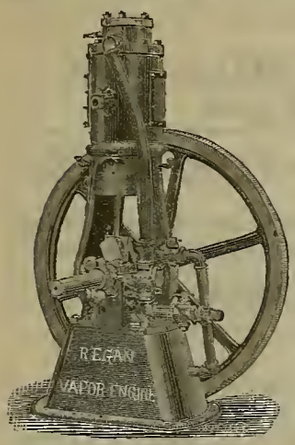
SALES DURING LAST FOUR MONTHS:

COMPOUND, 44 ENGINES, 5215 HORSE POWER. STANDARD, 99 ENGINES, 4500 HORSE POWER. JUNIOR, 166 ENGINES, 4260 HORSE POWER.

Grand Total, 309 Engines, Aggregating 13,975 Horse Power.

21 and 23 Fremont St., San Francisco, Cal. 189 Clarence St., Sydney, N. S. W.

REGAN VAPOR ENGINE.

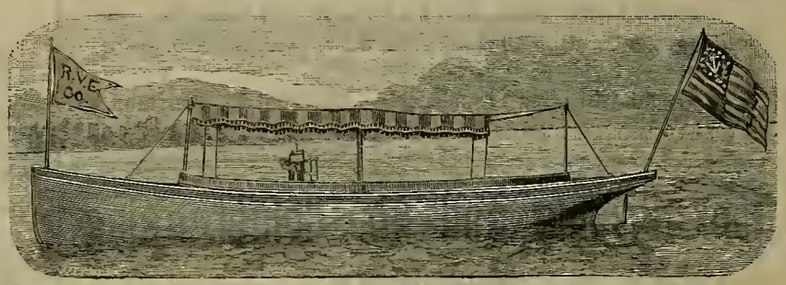


NO BOILER! NO FIRE! NO STEAM!
Simple, Compact and Cheap,
No Fire or Flame. Started Instantly without Even a Match.
No Ashes! No Explosion! No Engineer!
FULL POWER OBTAINED IMMEDIATELY.
The Moment Engine Ceases to Run, all Expense Stops.
NO DANGER.
Horizontal, Upright and Marine Vapor Engines and Launches.
Three fourths to Fifteen Horsepower.
From $175 to $1200.
Send for Our Large Illustrated Catalogue.

GEORGE HAAS, 824 Market St., Phelan Building, SAN FRANCISCO, Feb. 21, 1890.

REGAN VAPOR ENGINE CO.—Gentlemen: The ½ H. P. Engine you put up in our factory last November, has given satisfaction beyond my expectations. It do s my work better than than those two Electric Motors did, with scarcely any expense for gas. I paid the Motor Company $25 per month for power, while the Vapor Engine has cost me but $2 per month so far. But, be it understood, I have not used the Engine as much as in summer, but the cost of motor would have been all the same, making a saving of $69 in three months. I am satisfied the Engine will pay for itself in less than two years. I use it for freezing cream, run three fans, cocoanut grater, etc.

Yours truly, GEO. HAAS.



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The uses for small steam boats and launches are innumerable; they are convenient and serviceable for transportation and are a source of pleasure for those who are fond of sailing. But many have been deterred from purchasing such boats, because of the trouble and inconvenience of using coal, and the necessity of obtaining a Government license, engineer, etc. Our motor does away with these objections. The small space taken up by our engine in the boat **gives more room;** the boat will seat **twice** as many persons as one the same size fitted up with a steam engine. It takes only **two minutes to get under headway,** and can be stopped when running at full speed within the length of the boat, the reverse motion being instantaneous and effective. We carry in stock six regular sizes of hulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos. Kane & Co., Racine, Wis.

REGAN VAPOR ENGINE CO., 221-223 First St., San Francisco, Cal.

DOW STEAM PUMP WORKS,

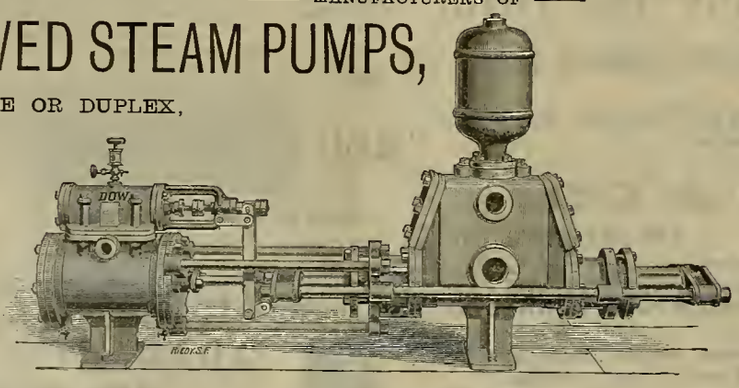
OFFICE AND WORKS, 114 AND 116 BEALE STREET, SAN FRANCISCO,

MANUFACTURERS OF

DOW'S IMPROVED STEAM PUMPS,

SINGLE OR DUPLEX,
For Every Possible Duty.

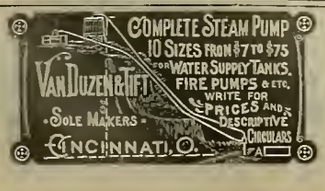
Mining Pumps,
IRRIGATION PUMPS,
Artesian Well Engines,
Etc., Etc.



Independent Air Pump and Condenser,
FOR STATIONARY ENGINES OR STEAM PUMPS.

POWER PUMPING MACHINERY,
SPEED GOVERNORS,
Balance Valves and Pressure Regulators,
FOR STEAM PUMPS, ETC., ETC.

CORRESPONDENCE SOLICITED.
SEND FOR CATALOGUE.



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OF EVERY DESCRIPTION.

AUTOMATIC GOVERNOR MOTORS our Specialty, for Electric and other fine regulation work. Our new MINING WHEEL with GOVERNOR a great success. Send for new Catalogue.

TUERK HYDRAULIC POWER CO.,
39 Dearborn Street, Chicago.

GRANGER'S ROLLER STAMP MILL

Beats them all. Works dry ores. Makes even granulation. No dead work, hence minimum wear.
A. P. GRANGER, Denver, Colo.

GRANGER'S DRY ORE SEPARATOR

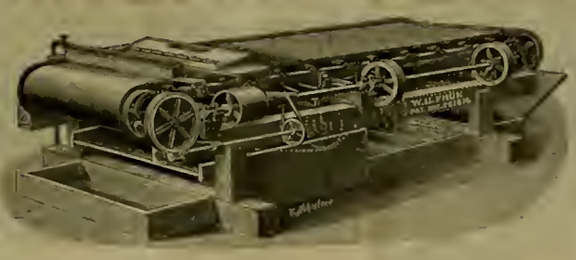
The very best. Uses no water. No freezing up. Saves hauling waste. Saves high percentage. Send for circulars.
A. P. GRANGER, Denver, Colo.

IMPROVED BELT FRUE ORE CONCENTRATOR.

The Best Ore Concentrator in the market, having double the Capacity and doing its work as close as the plain Belt machine, while its concentrations are clean. It is used in a number of Mills, the most notable of which is the Alaska M. & M. Co's Mill, where 24 Improved Belt Frues are taking the Pulp from 120 Stamps, crushing 350 tons per day, and is giving entire satisfaction as against 48 plain Belt Machines, taking the Pulp from the other 120 Stamps.

Price of Improved Belt Frue Vanner, $825, f. o. b.
Price of Plain Belt Frue Vanner, $575, f. o. b.

For Pamphlets, Testimonials and further information apply at office.



Protected by Patents December 22, 1874; September 2 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

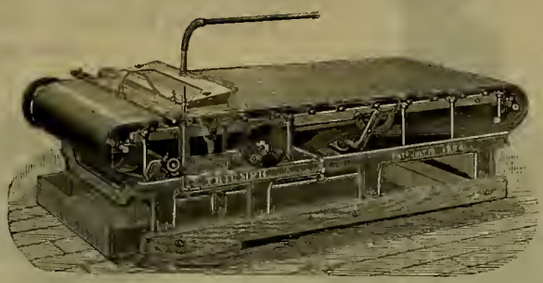
The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

—o—

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

—o—

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be.
Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

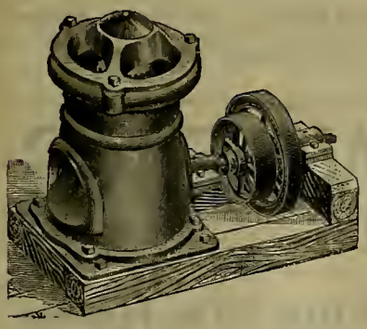
Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, Jr.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

GATES ORE AND ROCK BREAKER



UPWARD OF 2000 NOW IN OPERATION.

Guaranteed to do More Than Twice the Work of Any Other with the Same Cost in Wear.

The Gates Crusher having come so largely into use in all the Pacific Coast States, as well as in other mining regions, ample opportunity has been afforded for comparison, with the result that it has an admitted superiority for all such service. Wherever used in connection with the reduction of ores, the advantages have been so apparent, and the results so extraordinary, as to justify the belief that it will soon become a necessary part of every mill equipment, even to the discarding of all other styles of crushers now in use.

The most important feature of this Crusher is its capacity for fine work, it being possible with any size machine to bring the product down to cubes that will pass a ⅝" or ½" ring. By this means, the output of a mill is increased from 25 to 30% without additional cost.

SEND FOR CIRCULARS.

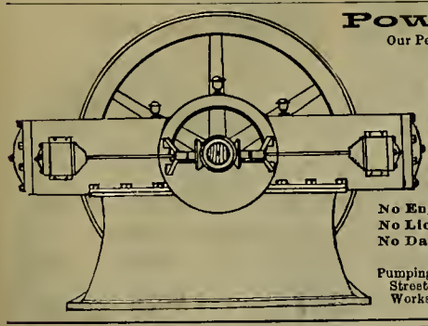
THE PELTON WATER WHEEL CO.,

121-123 MAIN STREET, SAN FRANCISCO, CAL.

GENERAL WESTERN AGENTS.

Power In or Out of the Shaft for Miners!

Our Perfected "Safety" Engines cost to run only 6 cents per working day and upward; they make their own vapor, and REVERSE instantly.

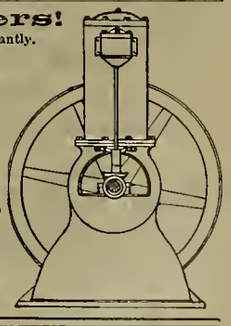


No Boiler, Fire, Smoke, Steam, Ashes, or Heat.

No Engineer, No License, No Danger.

Single, Double and Quadruple Acting.

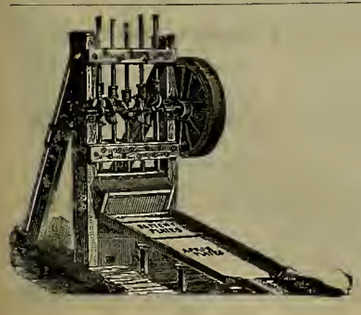
½ H. P. to 100 H. P.



Pumping Plants, Yachts & Launches, Street Cars, Fire Engines, Water Works, Etc.

ELECTRIC VAPOR ENGINE CO.,
218 California St., San Francisco.

Complete Plants of all kinds, Stationary or Mounted on Wheels.
U. S. AND FOREIGN PATENTS.



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SILVER-PLATED AMALGAM PLATES for SAVING GOLD

IN QUARTZ, GRAVEL AND PLACER MINING.

PRICES GREATLY REDUCED.

Only Refined Silver and Best Copper used. Over 3000 Orders filled. Fifteen Medals Awarded. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated.

These Plates can also be purchased of JOHN TAYLOR & CO., Corner First and Mission Sts

San Francisco Gold, Silver and Nickel Plating Works, 653 & 655 Mission St., San Francisco, Cal., E. G. Denniston, Prop'r.

Our Plates have been used for 20 years. They have proved the best. We adhere strictly to contract in weight of Silver and Copper. SEND FOR CIRCULAR.

JOSHUA HENDY MACHINE WORKS,

(INCORPORATED SEPTEMBER 29, 1882.)

Nos. 39 to 51 Fremont Street, - - - - - - - - - - San Francisco, Cal.

Manufacturers of NEW and Dealers in SECOND-HAND BOILERS, ENGINES, PUMPS and MACHINERY OF EVERY VARIETY.

Steam Pumps of all Makes,

CENTRIFUGAL PUMPS,

MINING PUMPS.

BLOWERS AND EXHAUST FANS.

LEATHER and RUBBER

BELTING.

Stationary, Portable, and Hoisting ENGINES and BOILERS.

Shafting,
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Boxes,
Hangers.

COMPOUND DUPLEX PUMP.

LUBRICATING COMPOUNDS and OILS of the Best Makes.

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Hydraulic Mining, Quartz, and Saw-Mill Machinery, Hydraulic Gravel Elevators, Hydraulic Giants, "Triumph" Ore Concentrators, Automatic Ore Feeders.

WOODWORKING MACHINERY

—COMPRISING—

Band Saws, Stickers,

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SHINGLE MILLS, Etc.

IMPROVED SINGLE AND DOUBLE CIRCULAR SAW-MILLS.

AGENTS FOR THE SALE OF

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CALIFORNIA WIRE WORKS

ESTABLISHED 1852. INCORPORATED 1882.

—MANUFACTURERS OF—

Steel Wire Rope,

—OF ALL KINDS FOR—

CABLE RAILWAYS,

ROPEWAYS and TRAMWAYS,

Mining, Shipping & General Purposes.

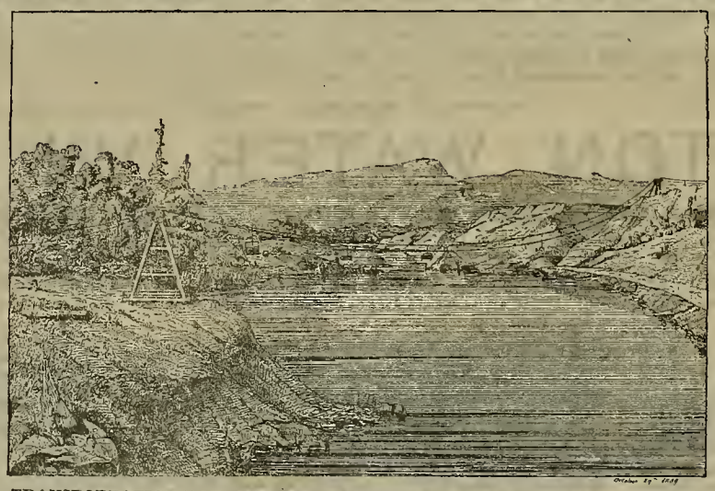
WIRE,
BARBED WIRE,
WIRE NAILS,
WIRE CLOTH.

Full Assortment Always in Stock.

OFFICE:

9 Fremont Street, San Francisco.

Send for Illustrated Catalogue.



TRANSPORTATION OF ORE BY HALLIDIE'S PATENT WIRE ROPEWAY.

HALLIDIE'S

PATENT WIRE ROPEWAY,

For the Economical and Rapid Transportation of Ore and other material.

Erected by Us During the Past Fourteen Years in Spans of

200 TO 2,000 FEET.

Simple, Economical and Durable.

HAVE BEEN THOROUGHLY TESTED In all Parts of the Country.

NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES

For SAVING GOLD!

IN QUARTZ, GRAVEL, OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates Replated, Bought, or Gold Separated. THOUSANDS OF ORDERS FILLED.

SAN FRANCISCO NOVELTY, GOLD, SILVER AND NICKEL PLATING WORKS,
108 and 112 First St., San Francisco, Cal.

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JUSTINIAN CAIRE, Agent,

521 & 523 Market St., San Francisco,

—DEALER IN—

Assayers' and Mining Material.

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BATTERY SCREENS AND WIRE CLOTH

Agent for HOSKINS'

HYDRO-CARBON ASSAY FURNACES

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 17.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, OCTOBER 25, 1890.

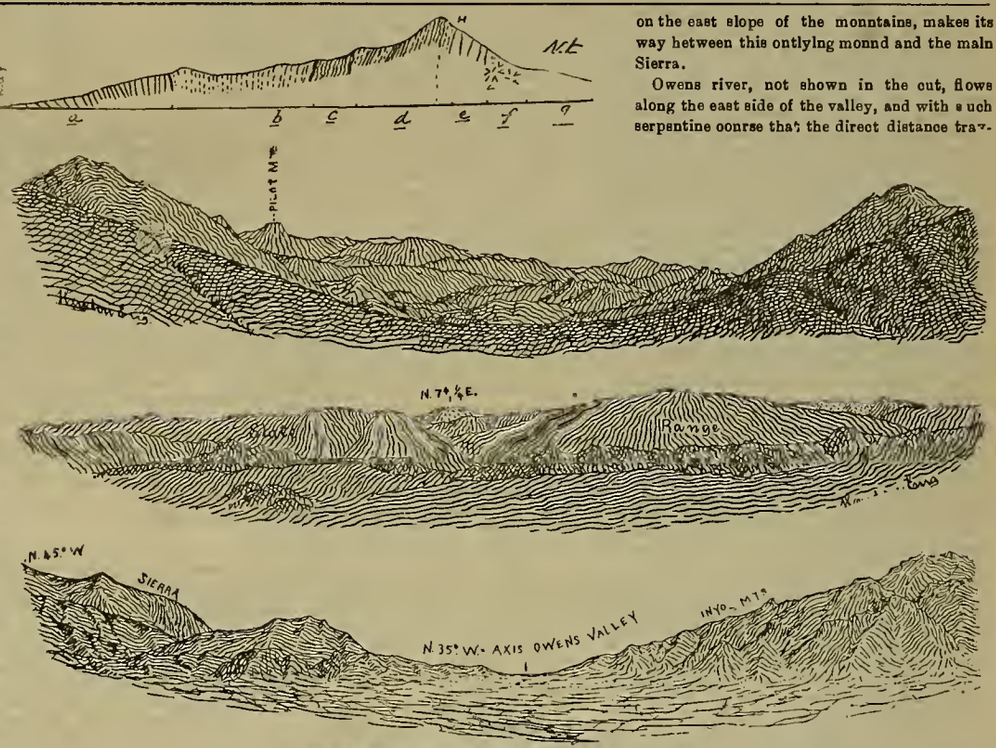
Three Dollars per Annum.
Single Copies, 10 Cts.

Mountain and Valley Views East of the Sierra.

We complete in this issue the series of articles with accompanying cuts, illustrative of scenes in the "High Sierra," which for several weeks past has been running in the columns of the PRESS. Before dismissing this subject it may be proper to remark that no adequate conception can be gained as to the character of the canyons that furrow the eastern slope of the great snowy range from the cuts we have produced. Their number and general direction are shown, but nothing of either their depth, their narrowness, or their steepness. To depict these, the reader must draw on his reason, or what is better, perhaps, on his imagination. So close together at their entrance, and so impending are the sides of these canyons that the sunlight, except for a few hours in the middle of the day, is entirely shut out from them. A line dropped from its upper edge will, in many cases, strike the floor of the canyon outside the base of the cliff, so far does the face of its wall depart from the vertical. The bottoms of many of these gorges are depressed below the crests of their separating ridges fully 3000 feet. Drifting into these depressions, the snow lies here most of the year, and not infrequently the whole year round. In the early summer, when the snow melts rapidly, the water rushing down them in great torrents carries along the cobbles and bowlders and heaps them up in immense moraines that extend far out into the valley below.

This slope of the Sierra is the region of the Kearsarge, which phenomenon occurs here with greater frequency and power than anywhere else. Attracted by the great height of the mountains, the clouds, surcharged with moisture, gather about the heads of these canyons, and "bursting," fill them to a depth of a hundred feet or more in a very few minutes. Were there here anything of value standing in its way, this rush of water might do much harm; as it is, however, it spends on to the valley, and spreading out there spends its force in a harmless way.

The timber growth along this face of the Sierra commences at a height of about 1000 feet above the valley, and extends thence to an altitude of about 10,000 feet, when it begins to dwarf, and a little higher up ceases altogether. From this source nearly the entire country for 500 miles east must ultimately derive its lumber, and in part also its fuel supply, unless deposits of mineral coal shall meantime be discovered there. As soon as the demand for these articles shall become stringent, railroads will be extended from the mountains into that region, thus rendering their transportation to points of consumption comparatively cheap.

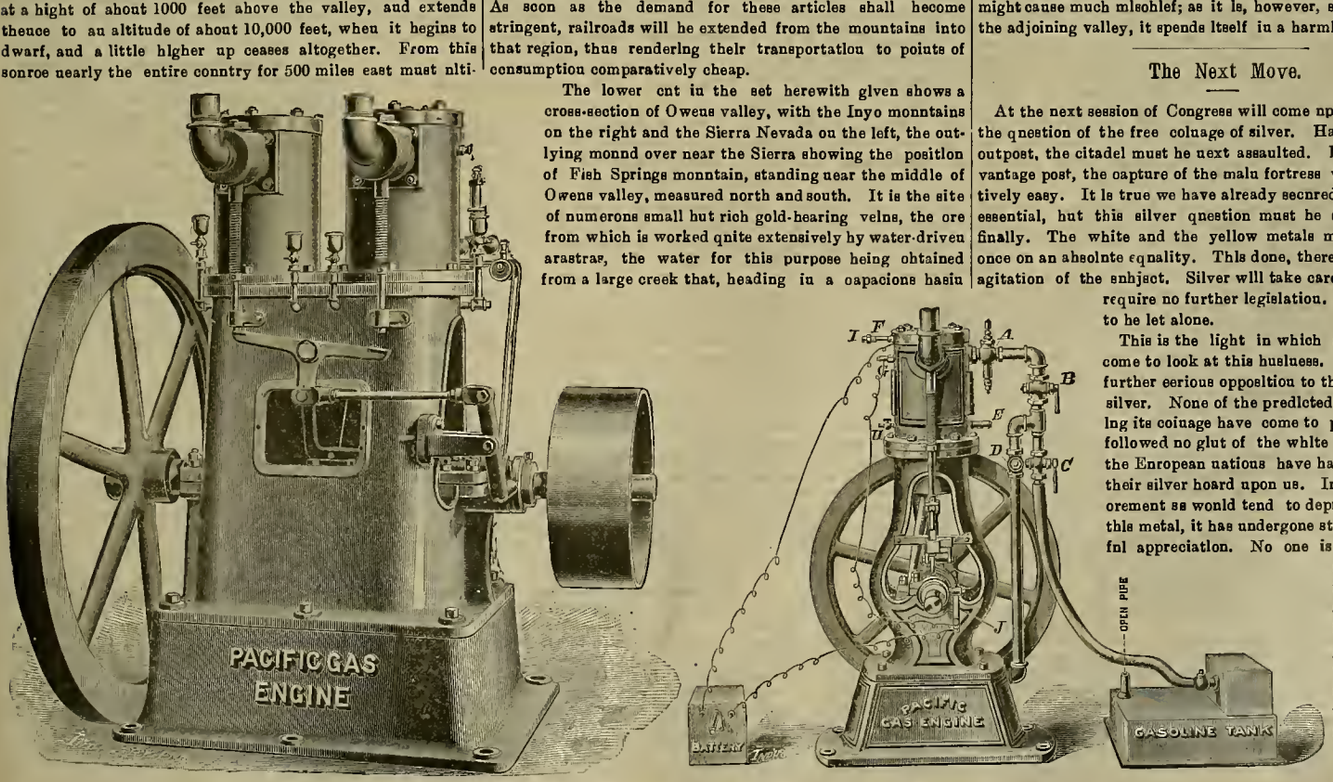


CROSS SECTION OF THE SIERRA NEVADA.

The lower cut in the set herewith given shows a cross-section of Owens valley, with the Inyo mountains on the right and the Sierra Nevada on the left, the outlying mound over near the Sierra showing the position of Fish Springs mountain, standing near the middle of Owens valley, measured north and south. It is the site of numerous small but rich gold-bearing veins, the ore from which is worked quite extensively by water-driven arastras, the water for this purpose being obtained from a large creek that, heading in a capacious basin on the east slope of the mountains, makes its way between this outlying mound and the main Sierra.

Owens river, not shown in the cut, flows along the east side of the valley, and with such serpentine course that the direct distance tra-

eled by it is more than doubled by its sinuosities. Were there here anything of value standing in its way, this rush of water might cause much mischief; as it is, however, spreading out over the adjoining valley, it spends itself in a harmless way.



SINGLE AND DOUBLE GAS OR GASOLINE ENGINES OF THE PACIFIC GAS ENGINE COMPANY.—See page 278.

The Next Move.

At the next session of Congress will come up for consideration the question of the free coinage of silver. Having gained the outpost, the citadel must be next assaulted. Holding now such vantage post, the capture of the main fortress will be comparatively easy. It is true we have already secured nearly all that is essential, but this silver question must be settled now and finally. The white and the yellow metals must be placed at once on an absolute equality. This done, there need be no more agitation of the subject. Silver will take care of itself; it will require no further legislation. It will only ask to be let alone.

This is the light in which all parties have come to look at this business. There will be no further serious opposition to the free coinage of silver. None of the predicted evils of enlarging its coinage have come to pass. There has followed no glut of the white metal. None of the European nations have hastened to dump their silver hoard upon us. Instead of such increment as would tend to depress the price of this metal, it has undergone steady and healthful appreciation. No one is complaining of nor any longer fighting the new silver law. Having done such good preliminary work, it only remains for us now to go one step farther and effect by law the full and final rehabilitation of silver.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XVI.

[Written for the PRESS by JAMES H. CROSSMAN.]

Highland Mountain District.

There occurs in this district an extensive gold-bearing lode traceable by workings and croppings in an easterly and westerly direction for a long distance. On this lode have been located three claims, known as the Gold Drop, the Side Winder and the Keyhole. Running near and parallel with this is another lode, the ore from which assays at the rate of $48 per ton.

The whole mountain slope northerly from the main vein seems mineralized for a distance of 300 feet, ore assaying in gold an average of $5 per ton. The vein in the main lode varies from 6 inches to 5½ feet in width, and will average 20 inches. The average assays of the ore on the 100-foot level of the Side Winder return $34 per ton. On this mine the principal development work has been done. Four shafts have been put down here. The main working shaft, No. 1, situated near the center of the claim, is 112½ feet deep, with sump 8 feet deep. No. 2, situated 448 feet farther west, has been sunk to a depth of 100 feet. At a point 232 feet westerly from this an adit has crosscut the formation for 30 feet to the vein, from which a level has been driven easterly 992 feet, intersecting shafts 1 and 2. This adit carries ore the whole distance, proving the ore chimney to be at least that long. From this adit a winze has been sunk between Nos. 1 and 2 to a depth of 50 feet, the bottom of which is in ore that assays $51.50 per ton. Between Nos. 1 and 2 the ground has been stoped to a hight of 10 feet; this, together with the ore extracted from the second shaft, yielded 750 tons. Two hundred and fifty feet westerly from the intersection of the adit level with the main vein, shaft No. 4 has been sunk to a depth of 55 feet, an adit having been commenced at a point 140 feet below the level referred to, which will afford 240 feet backs. A new 10-stamp mill, with all modern improvements, has been erected on the bank of the Mojave river, 13 miles distant from the mines, to which contracts have been made to haul ore for $2.50 per ton; back freight $1.50. This mine has been recently purchased by a gentleman from Colorado, who, being well acquainted with working this peculiar class of ore, is confident that he can work it up to 80 per cent of its assay value. Timber for mine purposes can be delivered at three cents per running foot.

This district contains within its boundaries 972 square miles, it being the largest in San Bernardino county. This extensive area is subdivided into "camps," which form centers of surrounding groups of mines known as follows: Victor, Highland Mountain, Oro Grande, North Central and West Camp.

Victor Camp

Is situated at an elevation of 2713 feet above the level of the sea, and being a railroad station it forms the receiving and distributing point for a large area of mining territory lying easterly from the Mojave river, as well as for several important mineral localities surrounding this district. The St. Johns and Shearer granite quarries previously described are in the immediate vicinity of the town, adding to its prosperity. The Harrison, containing the ores of zinc and lead in the form of a sulphide, lies northerly 4½ miles, inclosed in a belt of limestone. Adjoining, and near the line of contact of the granite, a shaft has been sunk to a depth of 18 feet. The ores, by assay, show 17 per cent lead, 35 per cent zinc and 27½ ounces silver per ton. Thence 10 miles easterly we reach the base of Highland mountain, which forms one of a series or cluster of isolated peaks composed of granite and feldspathic rocks traversed by dykes of trap, much stained and discolored by the oxides of iron, manganese and other metals, showing a high state of metamorphism. Bodies of calcite also occur, both magnesian and carboniferous. In these formations well-defined veins of quartz occur carrying the ores of gold, silver, lead and copper. On the northerly flank of the mountain, 12 miles easterly from Victor, at an elevation of 3800 feet, we find a gold-bearing vein known as the Side Winder. Its strike is easterly and westerly, inclosed in walls of decomposed porphyry and a soft talcose slate overlaid and underlaid by syenite. The vein is from 18 inches to 4 feet in width, stained and discolored by the oxides of iron and manganese, rendering the gold produced somewhat difficult to save by the free-milling process. Assay of ore yields from $20 to $50 per ton. A 10-stamp mill was erected at a point opposite the mine, on the Mojave river, for reducing the ores, but the results proving unsatisfactory and the process in use not adapted to the ores, the stamps were hung up and the mill is now idle.

A shaft has been sunk here to a depth of 150 feet with lateral drifts on the vein for 200 feet. The vein is traceable on its line of strike for a distance of 2000 feet. The easterly extension is known as the Gold Drop, with a 20-foot shaft with the same character of ore on the westerly extension called the Keyhole. Two shafts, respectively 26 and 10 feet in depth, show the same character of ores with about the same per ton value. There seems to be no good reason why the ores of these mines should not yield good returns with a proper system of concentration. About one mile distant on the southerly flank of the mountain a body of calcite occurs on which a quarry has been opened for the purpose of extracting its marble, which is reported to be of a superior quality. Contracts are being let for hauling the stone to Victor for railroad transportation to a market. Easterly, one-half a mile, we reach

The Greenback.

Elevation, 3725 feet, course N. 20 E; formation, lime shale and syenite gangue, calcspar vein four feet in width; ores, carbonates of copper and silver; thence southerly two miles,

The Imperial

Is reached. Strike of vein, N. 20 W.; dip, southwesterly 18°; gangue, quartz; lode, 7 to 10 feet in width; pay chute, 150 feet long; vein traceable 1000 feet, incasing walls talcose slate and syenite, carrying clay selvages, vein heavily mineralized with iron oxides, gold values (work) $9 per ton; but little development. The Homestake and Little Gold mine in the vicinity are both promising veins.

The Blue Jay

Is situated nine miles east of the Mojave river in the same range; formation syenite, with a lime cap, heavy croppings and copper stain; shaft 10 feet deep, crescent 40 feet, exposing 15 feet ore vein much wider; ores, carbonate of copper carrying from 30 to 40 oz. silver per ton. Shipment to San Francisco gave a net result of $47 per ton. Thence easterly we reach a parallel range, no name, granitic axes with a belt of limestone on the westerly flank at and near the intersection of the two; formation, a well-defined vein carrying the ores of lead and silver, the former a sulphide galena, the latter a chloride; assay returns show 47 per cent lead and 22 oz. silver per ton. This is known as the Lead mine, development unimportant. These isolated ranges contain perennial springs of good water of sufficient flow for domestic purposes, but not in quantity for steam or reduction work. Oro Grande Camp, elevation 2625 feet, is situated on the bank of the Mojave river, is a station on the California Southern railway of the Santa Fe system. This camp also forms a trade center for an extensive mineral area. The mountain from which the camp or town derives its name is a storehouse of mineral wealth, containing well-defined veins carrying the ores of gold, silver, copper and lead. They are, however, of a refractory character and either require chemical treatment or a smelting plant whereby the precious metals can be extracted by the assistance of a lead flux. Attempts have been made and a 10-stamp mill erected at Oro Grande for the purpose of treating the ores by the wet way, but without beneficial results. Oro Grande reduction works, erected at Oro Grande, could be run by water taken from the Mojave river. A ditch has been dug from a point 2½ miles distant, capacity, 1700 miners' inches, affording at its outlet a pressure head of 32½ feet.

Lime.

Several quarries have been opened in the vicinity of the camp, from which a superior quality of lime is manufactured. Four kilns for burning have been erected and two double kilns are in constant operation. Wyman's quarry, 250 feet long by 100 feet wide by 60 high, is a steady producer. There is a ready demand for the lime at the kilns at $1.50 per barrel. Ascending the mountain, which lies east of the town, at an elevation of 3750 feet, we reach the Oro Grande mine, strike N. 30 E., formation porphyry on hanging and trap on foot-wall, gangue quartz friable, and in place saccharoidal, well mineralized; strength 8 to 9 feet, ores silver and copper. At main shaft a large spur falls in from the west, causing an expansion of the ore body. Two shafts, inclining 65 degrees, have been sunk on footwall of lode; No. 1, 100 feet deep; No. 2 50 feet.

Blue Jacket, elevation 3300 feet, gangue calcareous quartz, strike N. E. and S. W.; formation dolomite, strength of vein eight feet; shaft 10 feet deep, ores silver, copper and iron.

Eagle mine, 18-foot shaft, 4 feet wide; no walls on either side of shaft, vein much larger, croppings 10 feet. Assays of ore show 30 ounces silver and 17 per cent lead.

Oro Fino, elevation 3700 feet, strike E. and W.; formation feldspathic granite; dip 65 degrees S.; gangue quartz; strength from 6 to 20 inches, shows by horn-spoon tests $20 per ton.

Carbonate mine, formation blue limestone, stratified; gangue calcareous quartz, strength in croppings 2 feet at bottom of mine; vein 4 feet; assay value of ores at a point near the surface and assay returns show 40 per cent lead 57 ounces silver per ton; at the bottom of the mine, 140 ounces silver and 45 per cent lead, the latter principally carbonate, on which, at the writer's visit, a shaft had been sunk to a depth of 80 feet.

(To be Continued.)

THE San Francisco Bridge Company has been awarded contracts for the building of three bridges on the Canadian branch of the Great Northern over the Skagit, Stillaguamish and Snohomish rivers. The contracts are conditioned for the completion of the bridges by December 1st. They are to be truss structures, and the total cost will be nearly $150,000. The Snohomish bridge will be 1700 feet, the Stillagnamish 400 feet and the Skagit 600 feet long.

The Building of Cities.

A very interesting indication of the relative progress of different cities throughout the country is furnished by the totals of the building statistics. The totals of structures erected in 1889, with their cost in 15 of the leading cities, with some allowance for local conditions, are a very good measure for the growth and enterprise of the different communities.

In this showing Philadelphia maintains the lead, having put up 11,965 houses, while New York comes next with 6722. But in considering the cost of the buildings, New York is far ahead, having put $75,912,816 into new buildings, while Philadelphia's total of cost is but $26,000,000, and is exceeded by Boston as well as New York. These are the two cities whose new structures exceeded 5000. Following these are six cities where between 4000 and 5000 houses were built, and six more whose totals are between 2000 and 4000, in the following order:

	No. Houses.	Cost.	Average.
Chicago	4,931	$25,065,500	$5,083
Brooklyn	4,500	25,619,405	5 706
Boston	4,431	32,400,000	7,312
Minneapolis	4,355	8,737,281	2,006
Washington	4,048	6,165,715	1,523
Cleveland	4,007	4,401,854	1 098
St. Paul	3,756	7,939,403	2,113
St Louis	3 544	9,765,700	2.755
Pittsburg	3,241	8 000,000	2,468
Denver	2,741	10 807,377	3,942
Omaha	2,498	4,663,735	1,803
Cincinnati	2,104	4,143,214	1,969

In giving this comparison its proper value, it should be remembered that there are other things shown in it than the number of new buildings built. The total of cost shows the aggregate investment more clearly than the number of buildings, while the average cost of each building gives a better idea of the standard of architecture in each city than either of the other two. New York, while second in the number, is far ahead both in the total investment and in the average cost of buildings, which was $11,293. Philadelphia, while first in number and second in total cost, has an average for each building of but $2172, which gives it the eighth place on the list in that respect. Pittsburg has to take the eleventh place for number of houses, rises to the ninth for total investment, and its average cost of $2468 gives it the eighth place. While Cleveland is credited with 4007 houses against Pittsburg's 3241, her low average cost of $1098 brings the total investment down to $4,401 854, or a little more than half of Pittsburg's.—*Pittsburg Dispatch.*

IRON ORE OUTPUT AND FREIGHT.—The steady increase over last season in ore shipments is a surprise to both ore-shippers and vessel-owners, says the Cleveland (Ohio) *Marine Review*. Notwithstanding the delay at all ports, there is reason to believe that the total output of the Lake Superior mines will reach 9,000,000 tons, as the shipments up to the present time are in round numbers 6,000,000 tons, or about 900,000 tons in excess of the shipments at the corresponding time in 1889. It is a surprise to most ore-dealers that the movement should be so large in the face of disadvantages, but the ore is all sold, and a market might be found for more of it if it were to be had. The capacity of the mines has been reached, however, and enough vessels have been found to care for the output at moderate rates of freight. This active movement, with some demand for grain tonnage at Duluth, has helped the ore freight market, and there is a noticeable increase in the inquiry for boats at $1 from Ashland and Marquette, and 85 cents from Escanaba.

A COTTON PICKER.—Mr. A. Campbell of Chicago is the inventor of a cotton-picking machine which it is claimed will save 90 per cent of the present cost of picking. A company with a capital of $5,000,000 has been formed to manufacture it, and a factory to cost at least $50,000, and to employ 1000 men is contemplated. Each machine, it is estimated, will cost from $300 to $500, and it is claimed will do the work of 20 men. It consists of a two-wheeled cart, with a box receptacle to catch the picked cotton, and is drawn by mules. The motion of the cart sets in operation a system of fingers or pickers with mechanical appliances that do the work.

IT is stated that another great trunk line is to be built from New York to Chicago. It is to be known as the American Midland railroad, and is to begin at the terminus of the Central Railroad of New Jersey in Jersey City. It will run across New Jersey and traverse the anthracite coal region of Pennsylvania, and will then pass through the bituminous coal and oil sections of the Keystone State. It will cross and exchange business with 60 roads now in operation. The route selected is 120 miles shorter than the Pennsylvania and 200 miles shorter than the New York Central, and it will be the shortest between New York and Chicago.

PHILADELPHIA TO NEW YORK IN 36 MINUTES. Prof. Wm. D. Marks, engineer of the Edison Electric Light Company of Philadelphia, an electrical expert, says he is willing to stake his reputation as an electrical engineer on his ability to construct an electric motor that could take a train of cars from Philadelphia to New York in 36 minutes. One hundred and fifty miles an hour is the speed Prof. Marks' motor would have to make.—*Electrical Engineer.*

The Sequoia Forests of the Sierra Nevada—Their Location and Area.

[A paper read by FRANK J. WALKER at the California Academy of Sciences, Sept. 1, 1890.]

In the Standard Guide-Book to the Pacific Coast, of a late issue, we read this statement: "There are nine groves of big trees in California;" and in the descriptive sketch following this remarkable statement, we find three of the nine groves mentioned as lying south of King's river, vaguely described as: The King's River grove, the grove in the basin of North Tule, and the grove in the basin of South Tule. There are in the localities named, as containing three, no less than seven distinct groves and forests of big trees, while in the enumeration given there is no mention whatever by the author of the several groves and forests of Middle Tule, Kern or Kaweah rivers, nor of the most southern grove, on Deer creek; in short, the omissions comprise some 20 distinct Sequoia groves and forests, aggregating an area of at least 25,000 acres. Few, indeed, of the inhabitants of Tulare county, where most of the forests are found, have any conception of the wide extent of their Sequoia possessions; probably not one person in 500 knows of the existence even of big trees on the Kern-river slope, and many would dispute the fact—a fact I have never seen referred to in print—and yet there are no less than 2000 acres in that region, and some of it the most dense forest growth of *Sequoia gigantea* known to man. And so with other groves; many of them are to the general public practically unknown and unexplored.

The accompanying map is the first ever published with an approximate showing of the area, location or existence even of what is by far the larger part of our Sequoia possessions.

With reference to this map, it is my purpose in this paper to briefly mention what may be termed the forests of Sequoia, and the neighboring groves; and in making the distinction between forests and groves, it will be necessary to draw a somewhat arbitrary line; and for this purpose we will classify as forests all areas of 1000 acres or upward, and all below that as groves. According to this distinction, we can safely assume that all forests of *Sequoia gigantea* are to be found to the south of King's river, and nearly all of them in Tulare county; and with mere mention of the better known northern groves—the Calaveras, South Park, Tuolumne, Merced, Mariposa, Fresno and Washington—we will, therefore, confine our sketch to a description of this region only.

The first, going southward, and probably the largest compact body of all, is located on the south slope of the South Fork of King's river, in Fresno county. It is designated on your map as Converse Basin Forest. Its location may be given more exactly as in the northeastern portion of Township 13 South, Range 27 East, and the northwestern part of Township 13 South, Range 28 East, M. D. M., the larger part being in the latter township. [Please bear in mind that all townships and ranges hereafter given are south and east of Mount Diablo Meridian.] The area of this tract is about 5000 acres. These figures can at best be but an approximation. For most part, the Sequoia country is so broken, and the variation of density of growth so great, and the limits so vaguely defined, that an exact estimation is almost impossible; besides, it is likely to be misleading from the fact that it represents in some instances what might be called a heavy continuous growth, while in others it is more or less broken and scattering. In nearly all cases there is found mixed with the Sequoia a plentiful growth of other timber, principally yellow and sugar pine (*Pinus ponderosa* and *Pinus Lambertiana*), with a sprinkling here and there of fir, cedar and other growths. However, I have aimed everywhere to keep my estimates of areas well within bounds. This first forest, together with the one next in order, are owned by one of the leading lumber firms of California, and, next Wednesday, they celebrate at Sanger the completion of their 40-mile lumber flume, connecting their capacious mills in the mountains with the railroad on the plains. They propose to clean up everything as they go along, stripping the land bare and moving their mills and extending their flume from point to point as the timber supply becomes exhausted. It will probably take years for them to reach the Boulder Creek forest, in Township 13, Range 29, so named from the affluent of King's river, on whose slopes it is found. The area of this forest and neighboring groves cannot be less than 1500 acres, probably more. These two already mentioned lie altogether on the waters of King's river, in Fresno county, but the forest next to the south, the Fresno Big Tree forest, is on the divide between the waters of King's and Kaweah rivers, partly in Fresno and partly in Tulare counties. It lies in the contiguous corners of the four Townships 13 and 14, Ranges 27 and 28. Its original area cannot be computed at less than 2000 or 3000 acres, but so much of it has been stripped of its timber that its limits are hard to determine. Here have been the principal milling operations in Sequoia for the past 20 years. Four sections of it, containing what is known as the "Fresno Big Trees," have already been reserved by the United States Government, it being the only reservation ever made in these southern forests for the purpose of saving the Sequoia. This is the reservation recently confirmed by the Hon. Secretary of the Interior, and containing the famous big tree

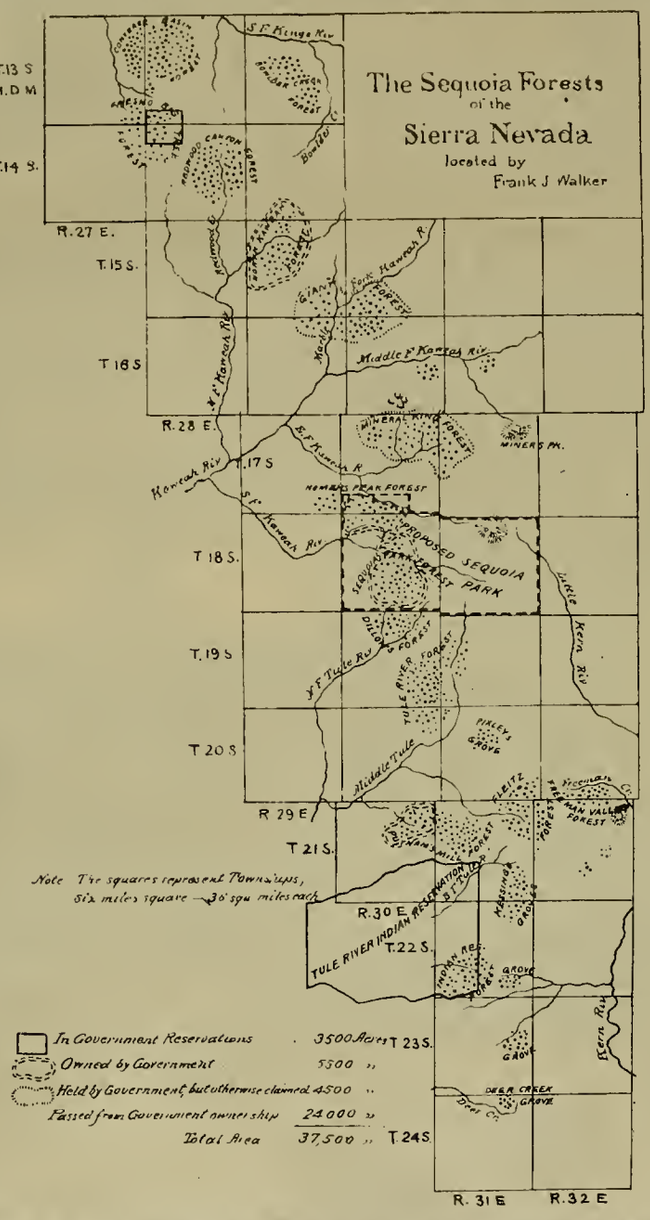
known as "General Grant," said to be 40 feet in diameter.

Passing on to the west side of Township 14, Range 28, we find along Redwood creek a forest of some 3000 acres. This most magnificent growth has also passed from the possession of the Government to private ownership. Farther south, we next come to a forest on the North Fork of the Kaweah river in the northwest portion of 15-29, and extending northward across the line into 14-29. There are here upward of 1500 acres of Big Tree forest still owned by the Government. The whole township is timbered and well worth preserving, aside from the Sequoia.

A few miles southward brings us to the Sequoia tract, known as the Giant forest, located in the contiguous corners of Townships 15 and 16, Ranges 29 and 30, where there is found an area of some 2300 acres of Sequoia. This, although still in the hands of the Government, is claimed by individual locators, by reason of their locations having been made in good faith and filed previous to the withdrawal from entry of these townships, as explained hereafter. It is generally thought that they will substantiate their claims and acquire the land, and public sentiment seems to favor it. Passing to the Middle Fork of Kaweah river, we find several groves, some of which are still in the hands of the Government, but there exists on this branch no Sequoia tract that could properly be called a forest.

Southward, on the East Fork of the Kaweah river, we come to what is designated as the Mineral King forest, from a mining district of that name, comprising, with the detached groves, some 3000 acres; the main body is in Township 17, Range 30, the township whose recent restoration to entry gave rise to the movement culminating in what is known as the Vandever Sequoia Park bill, lately passed in the lower house of Congress. In December, 1885, Commissioner Sparks of the General Land Office withdrew from entry 18 certain townships, of which this was one. The reason for this suspension was the alleged fraudulent character of the surveys. We need not consider the condition of these surveys, but from the character of the country it would seem that the sub-division lines of Township 17, Range 30, could be more readily run with a ruling pen than with chain and transit, and at that time the compensation for either system of survey was supposed to be the same. But one thing is certain, on many of the Government plats you will search in vain for any trace of Sequoia growth, even where the alleged lines run through sections now known to be heavily timbered with the mountain redwood. It is to this fact largely, no doubt, that the very existence of certain Sequoia forests has so long remained unknown to the public.

The fact that several of the suspended townships contained big trees had nothing whatever to do, so far as we know, with influencing the act of the Commissioner. But Commissioner Sparks "builded better than he knew," and the intimate outcome of his order of withdrawal has been to preserve, in the Government's undisputed possession, several forests of these big trees that would otherwise have gone the way of all the rest—into the hands of speculators and lumbermen. Thus the matter remained in *statu quo* till the opening of the present year, the friends of Sequoia preservation resting easy in the fancied security of their position, inasmuch as the Department had expressly declared its policy not to restore to entry these lands in advance of an official examination. At the opening of the present year, parties interested in acquiring timber, by some means, secured the release of the suspension of Township 17, Range 30. It was restored to entry on May 23d, and in less than six weeks the entire Mineral King forest was filed on by timber-land claimants, and the tract effectually cleaned up. While thus the greed for big-tree timber was developing, the supply was growing short and the attention of timber prospectors was turned to other forests; and it was found that in the township to the south, Township 18, Range 30, there was a forest practically unexplored that offered the best field for their next work. The same measures that had proved so successful in opening up Township 17, Range 30, were forthwith set to work to secure this more valuable prize. At this juncture a few citizens of Tulare county took steps to thwart the attempted spoliation of the Sequoia forests. As the forest in Township 18, Range 30, was the one the timber men most wanted, the inference was reasonable that it was the best of all for the Government to keep. We need not detail the ways and means adopted, but the ultimate outcome of the opposition has been the Vandever bill, embracing in its proposed reservation two townships and four sections to be set apart as a National Sequoia Park. This reservation includes the forest marked on your map as the Sequoia Park forest, and also the larger part of the Homer Peak forest, somewhere from 3000 to 5000 acres. South of these, following the Sequoia belt, in Township 19, Range 30, we come to the Dillon Mill forest, of over 1000 acres, with but little remaining to the Government, and from which thousands of Sequoia fence-posts are being hauled this season. And still farther southward, partly in the southeast corner of the same township and extending into the corners of three other townships, is the Tule River forest. Much "cutting and slashing" for a period of years, of which Prof. Eisen told you at a late meeting, has here been going on, and during this time different mills have been drawing their supply of mountain redwood from this forest, and still by far the larger part remains. Here exists a noted center of Sequoia growth known as the "McFadyen 80" (acres), estimated by lumbermen to have on it timber sufficient for 8,000,000 feet of lumber. Only one mill is running this season. This, with the Pixley grove, we will estimate at 3500 acres. About six miles directly south is the Putnam Mill forest, in Townships 20 and 21, Range 31, containing some 4000 acres. A portion of this, that in Township 20, Range 31, is still owned by the Government and is a very beautiful forest of over 1000 acres. In the northeast of this same Township 21, Range 31, and extending into the adjoining townships, is found the Fleitz forest, owned by a Michigan syndicate, while in the southeast portion of the same township, and extending into Township 22, Range 31, are groves owned by the syndicate known as the "Kessing," the several tracts



comprising an area of some 4000 acres. Here again, in the southwest of Township 22, Range 31, the Government possesses a forest of somewhat uncertain value and extent, known as the Indian Reservation forest, and estimated at 1500 acres. It is not generally known that there exists any Sequoia on the Kern river slope, but there are on that side at least 1500 or 2000 acres in groves scattered along the slope from Freeman's valley southward for some 15 miles. Only one of these tracts could be classed as a forest—that of Freeman's valley. Here is a tract of about 1000 acres, a limited portion of which is probably the heaviest growth of *Sequoia gigantea* in the world. Unfortunately this also has passed into the hands of lumbermen. One grove more remains to be mentioned, not because of its intrinsic merit, but because of its location, it being, so far as known, the southernmost limit of Sequoia. It is that on Deer creek, indicated on older maps as "Mammoth Grove." It contains less than 150 Sequoias, scattered over an area of perhaps 300 acres.

This completes the list. The Sequoia forests proper therefore extend over a belt of country beginning at Converse basin on the north and ending with the Indian Reservation forest, 60 miles to the south. The groves and forests together in this region are upward of 20 in number, with an average distance between them of perhaps three or four miles.

Within this scope of country, a moderate estimate of the Sequoia area would be, according to the foregoing figures and including a few unnamed groves, 37,500 acres, divided between the several river systems as follows:

King's river	7,500
Kaweah river	14,000
Tule river	11,000
Kern river	1,700
Deer creek	300
Total acres	37,500

It has been sufficiently shown that there are in the State several forests and groves of big trees still belonging to the Government, aside from those embraced in the Vandever bill. To insure the safety of these, and to put them beyond the designs of timber-men, and above all, to protect them from devastating forest fires, it is exceedingly desirable that they be reserved and placed under expert supervision. We need no reminder that the greed of timber and cattle men will soon work havoc with what remains, unless something be done to stay the devastation; and if we would save a portion we must begin at once.

Concerning the utility of the region embraced in these limits as the best natural reservoir for the storage of waters needed for irrigation, we need not dwell. But for a moment let me touch on the suitability of the country for a park because of its charming natural attractions. You need hardly be reminded of this. The heart of the Sierra culminating in Mount Whitney affords grand scenery of peculiar charm and great variety. Here are three Yosemites rivaling their noted prototype in many features, with a little world of wonders clustering around the headwaters of Kern, Kaweah and King's rivers. We will simply mention the Grand Canyon of the Kern, where for twenty miles the mad waters of the river are walled in with the continuous battlements of the California Alps, crowned with nameless and unnumbered domes and towers. Then, only a few miles across the divide, extends the canyon of King's river with its wealth of impressive scenery; and some eight miles farther to the north lies the Valley of Tehipitee—the gem of the Sierra—with its wondrous dome of rock rising in rounded majesty some 6000 feet from the level of the river-cleft meadow at its feet. Yet a view of the most impressive and characteristic scenery of the region is to be earned by scaling one of the lofty peaks of the Kaweah Range. At least a hundred peaks here rise to altitudes exceeding 10,000 feet. One never can forget the impression, who has once looked out over the California Alps from the pinnacle of Miner's Peak. As I once before said, in describing this scene: "Here amid the companionship of peaks one beholds with speechless wonder the spectacle beyond. No satisfactory view of the Whitney Range can be found from the San Joaquin plains. The intervening Kaweah Range veils the view of the higher peaks beyond. But here, standing on the crest of the Kaweah Sierra, one looks across the Grand Canyon of the Kern, and the encircling wilderness of crags and peaks is beyond the power of pen to describe. Mounts Monache, Whitney, Williamson, Tyndall, Kaweah and a hundred nameless peaks—the crown of our country—have pierced the mantle of green that clothes the canyons below and are piled into the very sky, jagged and bald, and bleak and hoary—a wilderness of eternal desolation."—*Zoe for September.*

PIG IRON IN THE FAR NORTHWEST.—The Portland *Oregonian* says that the production of pig iron, according to the census reports, is yet in its infancy in the Pacific Northwest, but a fair increase has been shown over the report of 1880. In that year the far Western States produced 3200 tons, and in 1890, 26,147 tons. This was, of course, for the fiscal year ending June 30. Of this, Oregon produced all in 1880, and 8411 tons in 1890, and Washington 4787 tons. This is all charcoal pig iron. The Far West, according to these figures, has not made very rapid strides in this particular industry, but this is accounted for on the ground that the people are engaged in pursuits that bring in greater returns. The investigations do not enter into the consideration of the existence of iron ore in either of these States, nor in any of the States for that matter, being confined to the actual production from the furnaces.

THE PIKE'S PEAK RAILWAY (Abt system) is progressing rapidly to completion in spite of some annoying delays. The first trial trip with a passenger car was made Aug. 14th; on the next day the road was opened to the public as far as the Half Way House, with two trains daily; but these were stopped, Sept. 1st, for lack of sufficient patronage, and because it impeded somewhat the work at the front. The cars are nearly all glass from window-sill to roof, with very narrow pilasters between windows. The track is now well above the timber line, within about 1000 feet of the summit.—*Eng. News.*

THERE are now two American-built locomotives running on the Tokio-Kioto railroad in Japan in competition with two similar English locomotives, all doing the same amount of work on a mountain grade of 132 feet per mile for ten miles of the distance. The American machines are of the Baldwin make; the English from the shops of Nasmyth, Wilson & Co. They are running in competition to prove their respective merits. The result of the trial will determine whether England or the United States can make the better engine.

RECENT INFORMATION says that a commission of inquiry investigating the trans-Saharan railway schemes has approved the route from Constantine and Biskara in Algeria across the desert to Lake Tchad. This route is by way of Tiemsen and Amesoltah and traverses the Tuarick country. The length is 2000 miles. This project is backed by the Banque de Russe et Francaise.

PITTSBURG, PA., is about to experiment with a double-deck street car. The car is longer, though not so wide as the car now in use, has 14 windows on each side, and will seat 42 persons on the inside of the car. On the roof there are two seats placed back to back, which extend the length of the car, furnishing a seating capacity nearly equal to that inside the car.

SHIP-BUILDING ON THE LAKES.—The ship-building industry on the American lakes is active, and Cleveland claims to lead the way. Since Jan. 1st the vessels built number 78 steamers, the gross tonnage being 63,922, and 18 barges and sailing ships of 15,315 tons. Last year the vessels built on the Great Lakes measured 107,080 tons.

THE value of merchandise exported from the United States during the 12 months ended Aug. 31, 1890, was $856,321,350. For the 12 months of 1889 the figures were $762,457,824. The value of the imports for the 12 months ended Aug. 31, 1890, was $791,220,608, and for 1889, $764,210,184.

AN English visitor to the St. Louis market recently was so struck with the superiority of American-made horseshoes that he ordered an entire carload for shipment to London. This is the first direct shipment of horseshoes from St. Louis to England.

A NEW IDEA in street rail is about to be adopted on the Broadway, New York, surface road, having a groove for the wheel flange to run in, but not wide enough to admit those of other vehicles.

THE Interstate Commerce Commission estimates that there are in this country 704,743 employes in the actual operation of the railways, or 459 to each 100 miles of road.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amedor.

From Sutter Creek.—*Ledger*, Oct. 18: Mining still continues to look up in this section. Improvements are fast drawing to completion at the Wildman. The frame of the mill is finished with the exception of the east side, which is left open to facilitate the getting in of mortar blocks and other heavy timbers which are nearly all ready to be placed in position. After the machinery is all in the building will be closed up and the stamps will be ready to drop. The ore-bin in another week will be finished, and the rock-crusher will be moved back directly in front of where the bucket dumps. The ore goes through the crusher into the bin and is then by means of a spout run into the car and taken to the mill, the idea of which is to distribute the coarse and fine rock evenly through the mill. Drifting in the Rose mine still continues, but nothing of value discovered yet. There remains 50 or 60 feet yet before they expect to encounter anything of a paying character. The sensation of the week here is the arrival of D. K. Valentine, bringing with him Sam Smitherum, as he states for the purpose of starting operations at the Mahoney mine. R. Redpath, the blacksmith, was put on. Mr. Smitherum was looking for half a dozen miners. They intended at least to repair about 75 feet of the shaft the first thing. The blacksmith put in one shift, when a telegram was received to withdraw and report progress. Mr. Smitherum recommends sinking a new shaft south. The proposition is now resting peacefully in the hands of the company and the peaceful rest of the mine will continue indefinitely.

Kennedy.—The new chlorination works have been run steadily for over two weeks. They were built at a cost to the company of only $3000, the contractor agreeing to work sulphurets for $10 per ton, and work them up to 90 per cent of their assay value. At this rate it is calculated that it will take only nine or ten months to reimburse the company for the cost of the works. The mine continues to look well. The south ore body is 30 feet wide, and yields about $7 per ton. The body running north is smaller, but of higher grade, yielding $12 per ton. Sinking in the north shaft has been delayed considerably on account of the volume of water met with.

Miscellaneous.—The Volcano Gold Gravel Mining Co. are repairing their flume its entire length, replacing everything except the bottom, putting in new blocks and sides. At the Amador gold mine everything is at a standstill. Nothing has been done in the way of satisfying the attachments. The Plymouth Consolidated mill has been shut down. All the hands have been discharged except six or eight miners for prospecting operations.

El Doredo.

Chili Bar Slate Quarry.—*Republican*, Oct. 20: As the demand for the slate here keeps in advance of the product, it will be necessary for the company to increase its labor force, which will no doubt be done, as work, with the preparations made for housing and protecting the men, can be carried on to advantage during the winter. As many men as can conveniently work are employed on the Mothersole quarry. At present a large amount of dead-work is being done. While some slate is being taken out, it will be a few weeks yet before the quarry is in a position to furnish as much slate as it did during the fore part of the summer. The river is now quite low, yet there is water enough to supply all the power which the slate quarries need to prosecute their work. The Big Sandy mine near Kelsey has shut down for awhile.

Inyo.

Modoc District.—*Index*, Oct. 15: This district is again looming up. Fitzgerald is pushing things in his mines, and J. J. Gunn will resume operations in the St. John mine this week. Eight or ten good miners are wanted by Mr. Gunn.

Beveridge.—Ben Lasky is in from Beveridge. He reports the prospects at Keynot as being very good. Considerable ore is on the dump, which will be crushed next month, when the mill will start.

Sylvania.—Inyo *Register*, Oct. 20: Work is being pushed along in the Liberal and Climax mines as fast as possible. A night shift has been put in the shaft being sunk on the ledge of the Climax. The tunnel of this mine is in about 350 feet and is expected shortly to reach the ledge. The Liberal shaft is down about 125 feet and gives promise of soon opening a body of rich ore. It is the intention to sink the Liberal shaft to the depth of 250 or 300 feet and run prospect drifts each way on the ledge.

Sorting the Slag.—J. Woods and M. Gearing have for some time been working on the dump of the old Log Spring furnace, five miles from Bishop, sorting the slag, with the intention of having it smelted again in the Sylvania furnace, but owing to the suspension of work thereon, they have quit work for the present.

Kern.

Beds of Gypsum.—Bakersfield *Californian*, Oct. 15: Would it not be profitable to develop the immense beds or deposits of gypsum lying from 6 to 10 miles east of this city? They are quite near the railroad and the material could easily be shipped. Burned, it becomes plaster of Paris, of which immense quantities have been used here within the past six months in the internal plastering and finishing of houses. Besides, it is applied to an infinite number of uses in the arts, such as obtaining copies of statuary figures, coins, medals, sculpture, carvings, for taking casts of natural objects, and for making stucco work, used in the interior ornamentation of fine apartments. It is employed as the material for molds for electro deposits and for the manufacture of embossed and pressed pottery ware. Ground, it is called plaster, and is one of the most valuable manures known, and has been found especially useful in soils surcharged with alkali. We know of no gypsum deposits in the State so convenient for transportation, and there is abundance of excellent fuel near. There ought to be great profit in working them and we hope they may attract the attention of persons competent to turn them to profit.

Mariposa.

Rich Ore.—*Gazette*, Oct. 18: The Hayseed mine, on Whitlock's, owned by J. B. Helm & Son, is turning out some exceedingly rich rock, from a ledge wide enough to make milling it very profitable. A gentleman who visited the mine in the early part of the week informed us that he saw a large handkerchief full of specimens, all very rich with gold, which Mr. Helm had taken from the ledge, with plenty of gold-showing rock in sight. Joe Schanz is also having some very good quartz crushed at the Ellingham mill. We hope all the miners and prospectors of that locality may meet with the luck they merit for having staid by Whitlock's and Sherlock's so faithfully. There is untold wealth over there, and perseverance is going to get there some of these fine days.

Nevede.

On the Washington Ridge. — *Transcript*, Oct. 19: Joseph Floyd and Alex. McCambridge are meeting with much encouragement at their claim a mile and a half from the Centennial. The tunnel at the Centennial is described as one of the best in the county. It is 800 feet long and as straight as an arrow. From the face of this tunnel the man dumping the car 900 feet away can be plainly seen. Capt. Richards, the superintendent, is pursuing his work intelligently and energetically, and will doubtless soon have a valuable mine for the stockholders.

The New Reduction Works.—*Tidings*, Oct. 20: W. C. D. Body & Bro., who have the contract for the erection of the Grass Valley reduction works, commenced grading for the foundation on Monday. The large scales have been put in place and are in good working order. The large building which is to be used as an office, laboratory, etc., is completed and is a credit to the builder and the company. It is the largest and best office in this county.

The Manhattan.—Grass Valley *Union*, Oct. 20: After several months constant work, the Manhattan mine on Gold Flat, which is under the superintendence of M. L. Elliot, has been pumped out to the bottom, a depth of 300 feet. The ledge in the bottom drift and in the stopes above is found strong, having a width of four feet, showing well in sulphurets, and which prospects in free gold. The fissure which carries the vein is very wide, being 20 feet between walls, and the hanging is regular and so smooth that it looks as if polished. From the 180-foot level, as far as it was extended, to the surface, the quartz has been stoped out, but below that to the 300-foot level, a considerable amount is standing in the stopes and can be easily extracted. Now that the mine has been pumped out there is no trouble in handling the water with the temporary machinery that has been put up, as the surface ground has been quite well drained of its surplus, although the large fissure furnishes considerable water. In the lower level of the mine, when it was pumped out, were found a lot of tools, which were left there 19 years ago, when the works on the mine were destroyed by fire. There were picks, shovels, drills, hammers, sledges, left by the miners as they "went off shift." With the exception of the shovels the remainder of the tools can be again utilized. The appearances are favorable for the Manhattan developing into an important mine.

Various Mines.—*Tidings*, Oct. 17: Supt. Edwin Tilley of the Peahody mine will soon commence to haul between 100 and 200 tons of rock to the Nevada county mill at this city to be crushed. The Central Mining Co., whose drift mine lies back of the Central House, have their tunnel in 575 feet, but will run it 60 feet farther before making an upraise to tap the channel. The Constitution mine, owned by Maltman & Myers, situated near Deer creek, three miles above town, is looking well. A crosscut was run from what was supposed to be the main ledge 20 feet to the north, where a ledge between two and three feet wide was struck which prospects big. Drifting on it is going on, and rock will begin to come out soon. There are three sets of men at work on the Nevada City mine. Hartman & Co. are putting a horse whim on the ledge in Wood's ravine. Jerry Black & Co. are working below the shaft, and Charles Beedle & Co. are at work on the new shaft. The miners say the rock is first class and they feel very hopeful.

North Banner.—Supt. Wheeler has the dead-work done at the Manzanita, which will soon enable him to largely increase his force. The new hoisting and pumping gear recently put in at the North Banner mine is now working in first-class shape. The mining and milling operations which have been stopped for some time are now running in their usual manner. It is expected that the machinery now in place will work the mine to a depth of 1000 feet.

Found a Quartz Vein.—Grass Valley *Union*, Oct. 16: Yesterday morning, while men were engaged in grading off a site for a wood-house at the new extraction works, they cut into a quartz vein, which was 14 inches between the walls, and contained fine-looking sulphurets and prospected well in free gold. This ledge will do to prospect, but the company has too much other work on hand at present to pay any attention to its exploitation.

Struck a Ledge.—Nevada *Herald*, Oct. 15: Francis Burns, superintendent of the big tunnel enterprise starting from the Yuba river and proposed to be run through to Grass Valley, informs us that his workmen have struck a ledge formation supposed to be three feet wide. The rock prospects well, and free gold can be seen in it. He is informed by those who have worked the Oro Fino mine that it is the same ledge. Mr. Burns expects to tap ledges right along as the tunnel proceeds. There are chances for good mines being discovered there, as the tunnel will cross a belt of country known to contain good-bearing ledges.

Placer.

New Quartz Mill.—*Republican*, Oct. 20: It is reported that the Valley View Mining Co. will soon commence the erection of a new Huntington mill on their property near old Whisky Diggings, which will have a capacity of 20 tons a day. Their lead is very strong and the ore is easily mined, and a fair milling test has yielded between $6 and $7 a ton. It is thought by those who have had opportunities for knowing that this will prove a good property. A. O. Bell of Bald Hill is still pushing forward his prospecting in the Mary Bell mine. Pike is confident that the days of the "beefbone copper" will come again.

San Bernardino.

Ten Miles of Pipe.—*Times*, Oct. 18: The Bear Valley and Alessandro Development Co. has contracted with J. D. Hecker & Co. of Los Angeles for the furnishing and laying of 10 miles of water-pipe from a point where the Mill creek zanja diverts the waters from Mill creek therefrom, a little north of east of Redlands, and running thence in a southerly direction to the wagon-road that runs from San Mateo through the San Jacinto canyon; thence along the said road to a point where the same intersects the north line of sec. 35, tp. 2 south, range 3 west, S. B. base and meridian, and being a distance of 53,000 feet. The pipe is to be wrought steel, and the total contract price is over $150,000.

Shasta.

Stopped to Repair. — *Free Press*, Oct. 20: Work in the Iron Mountain mill has been shut down for a few days, owing to the breaking of a part of the machinery.

Sierra.

Nugget Found.—*Mountain Messenger*, Oct. 20: R. P. Mott of Forest City reports that a nugget weighing 66¼ ounces and valued at about $1238—figured in the rough by Chas. Heintzen—the largest found near that town for many years, was recently picked up in a breast at the Golden Hope drift mine, owned by Mr. Mott and E. Cadman & Bros. This claim adjoins the Mammoth Springs a quarter of a mile below the new extension tunnel, another of the many proofs of the apparently inexhaustible richness of this noted Pliocene ridge that has within the past quarter of a century added millions of dollars to the treasury of the world.

New Mill.—A gentleman named Bigelow of North San Juan, Nevada county, is putting up a four-stamp mill on the Johnson ledge about 1½ miles from American hill, using one of the batteries of the Gen. Grant mill. The mill is to be run by water and will be in working order by the 15th of this month. The ledge is from three to four feet wide and prospects well.

Trinity.

Know Nothing Creek Mines.—*Journal*, Oct. 18: Detlef Hansen returned Tuesday from Know Nothing Creek, where he is interested in mines, and reports everything running favorably in that camp. In the Gold Run mine, Hansen, Junkans, H. and A. Dannenbrink have run a 300-foot tunnel which will give them 110 feet stope. The same company is crushing ore from the Hunter ledge in their four-stamp mill. They are now stoping out the Hunter ledge and when they have finished stoping, before running another level, will run the Gold Run rock through the mill. The Know Nothing mine, owned by Hansen, Bennett & Riley, started up last Monday. They have about 150 tons of ore out and this will keep the mill running till winter. Hansen & Dannenbrink are running a tunnel on the Hansen mine to tap the ledge in the bottom of the shaft at a depth of 70 feet. Mr. Hansen says that the summer's work has been satisfactory in the camp and that everything is looking well. New River is rather quiet this fall, but it is expected that business will improve as soon as the Ridgeway tunnel and shaft are connected by the upraise.

NEVADA.

Washoe District.

On the Comstock Lode.—*Territorial Enterprise*, Oct. 22: There are no extra hands at work in any of the mines. The same force that has been steadily employed since the breaking up of last winter, with but few exceptions, is now delving in the depths. The work performed in the Comstock mines from one end to the other is regulated by the ability of the mining companies to bear the expenses. There never was a more economical administration of our mining work than now, and there was never a more vigorous search for ore. There are no men at work this year for political purposes, but they are there for mining-work. The following comprises a portion of the mining operations along the lode during the past week. The reopening of the 1700 level of Con. Cal. & Va. has inspired the stock-trading public with the hope that a development of ore will be made on this level, and the north-end stocks have been strengthened by the work. The hope entertained is not groundless. There is pay ore west of the old bonanza stopes, and it may prove more extensive and even richer than the ore worked from the 1600 level, when the stock went up as high as $65 a share, and from which a long series of dividends has been paid.

Alta.—Worked 315 tons ore; average battery assay, $17.50 a ton. Upraising above 725 level from the northwest drift. Top of upraise in $12 ore and seems to improve as progress is made.

Yellow Jacket.—Shipping 78 tons of $19 ore daily to the Brunswick mill, and doing extensive prospecting work throughout the mine.

Overman.—Shipped to the Brunswick mill 130 tons $16 ore. Stopes yielding about as usual.

Confidence. — General repairs throughout the mine preparatory to prospecting for ore are still going on.

Crown Point.—No change of importance to report of either the east or west stopes. The west stope shows a little more ground in place, but the main supply comes from the old fillings. Shipped to the Mexican mill during the week 414 tons of ore; average battery assay, $14.98.

Con. Imperial.—The south drift from top of the raise on the 450 level is now in 270 feet, having been advanced 25 feet during the week, the face being in quartz of no value. Work on various other crosscuts and levels being pushed as usual with nothing of special importance to report.

Seg. Belcher.—The joint 1100 level east crosscut is out 113 feet; face in porphyry and quartz. The 850 west crosscut is out 224 feet.

Belcher.—The 200 north drift from the west crosscut is out 257 feet in a mixture of porphyry, clay and quartz. The face of the south drift from the 300 west crosscut is in low-grade quartz and porphyry. Have started a raise from the 1000 level to find the continuation north of the 1000 level stope body. Are up 22 feet in quartz assaying from $8 to $15 per ton. The 1100 joint crosscut is out 113 feet. The face is in porphyry and low-grade quartz. The 1300 north drift from the east crosscut is out 131 feet and has struck the old 1300 stope. There is some fair-grade ore in places at that point. The 1400 south drift is out 206 feet. The face is all quartz, giving low assays. In extending the 300 stope south on the twentieth floor a heavy clay was encountered, which has the appearance of cutting of the pay in that direction. Shipped to the Vivian mill 333 tons of ore, average battery assay $21.71 per ton.

Justice.—No change in stopes noticeable. Shipped 182 tons of ore; battery assays, $28.01.

Kentuck.—The 1000 level east drift extended 9 feet; total length, 117 feet; face in porphyry mixed with quartz. West drift on the same level, length, 105 feet; face in favorable looking vein material composed of porphyry, clay and quarz. Are opening out in the 950 south drift and finding some spots of fair-grade ore.

Savage.—We are extracting ore from the 500, 600, 750 and 1300 levels. During the week we have hoisted from these levels 842 cars of ore; shipped to the Rock Point mill 382 tons, and to the Mexican mill 403 tons; average battery assays, $21.83 per ton. We have bullion on hand amounting to $18,000. The southeast drift on the 1380 level has been advanced 26 feet. The last 12 feet of this drift is in ore that assays $25 a ton.

Hale & Norcross.—On 800 level northeast drift advanced 20 feet; total, 215 feet; face continues in low-grade ore. On 900 level, northeast drift advanced 25 feet; total, 135 feet; face in porphyry and streaks of quartz; have taken out old pump rod and columns to 1100 level in the north compartment of vertical shaft, and repaired the shaft, to this point. Are retimbering the 1300 level station and constructing new chute above the station for the incline car to dump into. In about two weeks will be able to resume work in the incline below the 1300 level.

Chollar.—Still making repairs on the 250, 450 and 750 levels. The raise from the 850 level, 60 feet south of north line, in the west drift, is up 30 feet in hard porphyry. Extracted and sent to mill 531 tons of ore; average battery assays, $17.87 a ton.

Potosi.—The north drift on the 1030 level is out 159 feet; face in porphyry. Have started an east crosscut from the end of this drift in 9 feet; face in quartz and porphyry giving low assays. The south drift on the 1130 level is in 67 feet; the face in quartz and porphyry giving fair assays. The north drift on the same level is in 70 feet; face in quartz and porphyry mixed. The winze from the 930 level is down 462 feet; no change in character of ground. The south drift from the main incline, 1230 level, is out 523 feet.

Alpha.—East crosscut, 70 feet north of shaft, 600 level, is out 106 feet, face in quartz giving low assays.

Exchequer.—East crosscut, near the south line, 600 level, is out 48 feet; formation, quartz and porphyry. North lateral drift, 600 level, is out 491 feet from the shaft; face in quartz and porphyry. East crosscut, 500 level, 150 feet south of north line, is out 198 feet; face in clay and porphyry.

Silver Hill.—Northeast drift from the winze, 600 level, is advanced 20 feet through hard porphyry; total distance from the winze, 440 feet. Northwest drift, 334 level, is out from shaft 510 feet; face in quartz and porphyry.

Con. New York.—No work except repairing and easing timbers on 650 and 800 levels has been done the past week. The north drift on the 1100 level is now out 230 feet; formation, quartz and porphyry.

Ward Combination Shaft.—East drift from the 1800 station is out 610 feet; face in porphyry and streaks of clay.

Utah.—725 level: East crosscut No. 2 from the main south lateral has been extended 72 feet; total length, 148 feet; formation is hard porphyry or east country rock. Have suspended work in the crosscut and will resume work in the main south lateral drift.

Occidental Con.—The stopes on the 400 and 450 levels are yielding sufficient ore to keep the mill running to its full capacity. Good ore is also being extracted from No. 2 upraise, which is 400 feet south of the main stopes. Have milled 290 tons ore of the average assay value of $22.40 a ton.

Humboldt District.

Eagle Mine.—*Silver State*, Oct. 14: The Eagle mill at Spring valley, owned by the Humboldt M. & M. Co., has started crushing ore from the Eagle mine. Thos. Harper, an experienced miner, has charge of the works. The mine is said to be looking well, especially in the new shaft, and the mill is reducing 30 tons of ore daily.

Hope Mill.—The Hope mill at Sanborn has started up and is doing good work. The mine is steadily improving, and at the greatest depth attained the ore is quite rich. The company has experienced some trouble from scarcity of water at the mill.

ARIZONA.

Mohave County Items.—Mohave *Miner*, Oct. 11: James Cadden after sinking 50 feet on the Kanawha Belle at Chloride has struck a two-foot vein of ore that will carry 7 ounces in gold. The new strike is just at water level, and is the finest showing that has been discovered in the district for some time. The shaft on the Flores is being shoved down as rapidly as three shifts can sink it. There is four feet of ore in the shaft that shows up well in coarse free gold. The Flores is looking far better than ever before.

Rich Gold Ore.—Prescott *Courier*, Oct. 15: Messrs. Frank and Paul Dillon came in recently from their mine near the Hillside, in Eureka district. Their tunnel is 80 feet; ledge, five feet thick; ore assays $200 per ton in gold and silver, mostly gold. A team with five tons is near Prescott. They intend to keep on shipping ore. Col. Bigelow and others have returned to town from a prospect east of Agua Fria creek, with specimens of gold, silver and copper ores; also beautiful pieces of jasper and onyx.

Speculation Group. - Arizona *Enterprise*, Oct. 11: Lemuel Bannister for himself, and Geo. Westinghouse, Jr., of Pittsburg, Pa., have purchased for $75,000 the Speculation group of mines in Pima district, better known as the Olive Camp. The mines are located 18 miles south of Tucson, and experts state that there is $2,000,000 in ore in sight.

The Gunsight Mine.—Lying 60 miles south of Gila Bend, the Gunsight shows 2100 feet of development. A fine three-compartment shaft has been sunk 460 feet vertically. Down this shaft 200 feet a crosscut was run about 50 feet to the vein which was found to be an immense lode 42 feet across, of silver-bearing free-milling ore, worth at least $30 per ton. Probably there is in sight the biggest deposit of precious metal rock in this mine that can be found in the Southwest. Certainly there is nothing like it in Arizona. The ore resources are simply enormous. On the dumps outside are piled 10,000 tons ready for treatment.

Ore and Bullion Importations.—The No-

gales *Herald* gives the importations of ore and bullion from Sonnra, Mexico, for September as follows: Omaha & Grant Smelter, Denver, 454,000 pounds, valued at $59,125. Rio Grande Smelting Wnrks, Socorro, 273,000 pounds, valued at $31,863. Philadelphia Smelting Works, Pueblo, 142,000 pounds, valued at $10,845. El Paso Smelting Works, 152,000 pounds, valued at $22,111. Denver Smelting Works, 34,000 pounds, valued at $1585. Selby Smelting and Reduction Works, San Francisco, 15,000 pounds, valued at $3007. Nogales Sampling Works, 43,500 pounds, valued at $3487. Total, 1,113,500 pounds, valued at $132,023. Silver bullion to the value of $36,927, and gold bullion to the amnunt of $56,320 are the bullion importations; also $27,000 in Mexican silver dollars. The duties collected during the month amounted to $631.05.

BRITISH COLUMBIA.

KOOTENAY ITEMS.—*The Miner*, Oct. 14: The diploma for the best mineral exhibit at the Tornnto Exhibition was awarded to West Kootenay. A crnwn grant has been applied for by the owners of the Pnorman. A plumbago find is reported on the north side of the Kootenay.

DISCOVERIES.—*Inland Sentinel*, Oct. 11: The richest discoveries made this year north of Trail creek and Kootenay lake were made in the Lardeau by J. W. Haskins on Campbell mountain, over the divide eastward from Trout lake. He staked and recorded five claims, some of which run high in silver, 80 per cent lead and over $200 in gold. There are several men who are working at placer mining between North Arm and Trout Lake, among them P. M. Walker, and they are reported to be doing quite well.

COLORADO.

WILL NOT CLOSE DOWN.—Aspen *Times*, Oct. 11: A report was started yesterday to the effect that the Compromise mine was about to close down, but it proves to have been unfounded. The company will not close so long as it can get rid of its ore. There has been much difficulty in securing cars for some time, but there is now a prospect of the famine coming to an end shortly. Mining operations in the Regent are temporarily suspended, pending the completion of some repairs and improvements. Arrangements are being made for running air-drills in the southern part of the property, and this involves the laying of a line of pipe. The Johnson strike proves to be as big as was first reported, and it is bewildering to contemplate the vast wealth of the mine should the recent discovery prove to be a regular ore chute. A number of Aspen parties are interested in a recent strike made at Winfield, in Chaffee county, that is of great promise.

THE LEE MINE.—Reports from the Robert E. Lee mine at Tin Cup are of the most encouraging character. The ore body is from 5 to 10 feet thick, and the grade of mineral is good. The mine has begun regular shipments, and the outlook for the property is exceedingly good.

LAKE COUNTY. — *M. and S. Review*, Oct. 15: The Horseshoe district bas taken a fresh start lately and everything in that locality appears to be booming. On the Peerless Maud property a tremendous amount of development work has been done, and they are now about to ship largely, though they find considerable difficulty in procuring a sufficient number of miners to do their work. The Black Prince crosscut reached the lode last Wednesday and the vein shows a fine streak of solid ore 18 inches wide, besides which there are 10 to 15 feet of gold quartz that will run $15 per ton.

DAKOTA.

BLACK HILLS ITEMS.—Deadwood *Pioneer*, Oct. 15: The Calletta group of mines is a new discovery made only last July. It is situated on the north side of Galena gulch, and comprises six claims. Last week they shipped 726 pounds of ore which netted over $17.50, an average of over $50 a ton.

DOGTOWN.—This is a little village near Hill City, surrounded by tin claims, is prosperous and will soon have a newspaper of its own. The Harney Peak Co. is doing good work on the claims in that neigbborhood.

CUSTER COUNTY.—Titus E. Corkhill, inspector of mines, returned yesterday from an official visit to Custer and Pennington counties. From bim we learn that the Flora, Tin Reef, Old Jeff and Czar tin mines are sinking shafts with the aid of Ingersoll rock drills, and are showing good bodies of ore. There is said to he a man in the Hills who proposes to treat refractory ores free of cost. The process has not been made public—possibly mercurial evaporation. Hill City is the most prosperous little community in the Hills, with brilliant prospects for the future. It is situated exactly in the center of the tin belt, which is about 30 miles long and three miles in breadth.

IDAHO.

BOISE DISTRICT. —Idabo *Statesman*, Oct. 12: The American Mining Co. of Helena, Montana, bave bought out A. Kleinschmidt's interest in the Seven Devils' copper mines for $1,600,000, and capitalized their company at $5,000,000. Contracts are being made for hauling to Weiser ore for shipment to Belleville, Illinois, Smelting Co. Next season a railroad will be built, and the greatest mining camp in America, if not in the whole world, will be started. The strike in the Hillside mine, near Bellevue, is of ore that nets $140 to the ton. On the head of Smitb's gulch Sam Boorn, Green Martin and A. B. Linderman bave struck it rich. Their ledge is not so large as the Sunlight, but the ore from it is just as rich. They have a two-foot vein of ore that will go from $200 to $300 per ton. Last Tuesday morning a small piece of galena was brought down from the famous Morning mine and left at the U. P. depot to be sent to the Spokane Exposition. When placed on the scales it weigbed 405 pounds. Work on the new concentrator at Wardner is progressing quite rapidly, 265 men being employed on this work.

MONTANA.

FROM HELENA.—*Mining Journal*, Oct. 15: The outputs of the St. Lawrence and of the High Ore, Green Mountain and Jim, comprising the active mines of the Chambers Syndicate, aggregate 85 cars a day, which are sent tn the Anaconda smelter. Other mines belnnging to the Anaconda Co. are being put in condition for early prnduction, and the company will shortly bave as many men on its paymll as at any time during its existence. The Granite and Bi-Metallic Co.'s disburse nearly $100,000 per montb to employes in the mines and mills, and it is predicted that the disbursements of other properties of the camp will bring the amount up to $200,000 at no distant day. Evidently Granite is a good camp to tie to. A mineral-bearing lead, 250 feet wide, carrying silver in sulphide form, is said to have been discovered recently 12 miles north of Champion, on a branch of the Cottonwood. The ore assays 12 nunces silver frnm the surface. The Boston & Montana Co. at Butte is about to change from the old method of hand to air drilling.

DRUMLUMMON OUTPUT.—*Montana Mining Review*, Oct. 12: The following is the output of the Drumlummon mine for the month of September. It will be noticed that the mine had this month increased its output, and the report from the property wnuld indicate that the monthly output will steadily increase: 60-stamp mill crushed 3603 tons, yielding $54,800; 10-stamp mill crushed 501 tons, yielding $16,600; 50-stamp mill crushed 2800 tons, yielding $24,100; total, $95,500; working expenses, $54,500. Mr. J. M. Ellis of Clancy recently made a discovery of a rich lode on Clancy creek, about one mile above its junction with Prickly Pear creek. The vein has an average width of 9 to 18 inches and assays nearly $200 per ton, one-fourth of which is gold. It is rumored that rich placer ground has been discovered in the upper Stinking Water country, the nearest point for supplies to the new discovery being Red Lodge. It is understood that two men made a cleanup of $140 in four days' sluicing in these diggings. The officers and leading stnckholders of the Granite Mountain mine held a meeting in St. Louis on the 4th inst., and gave a 90-day option on the property to the American Investment Co. of London at a figure close to $30,000,000. The chances are that the sale of the Granite Mountain will lead to the sale of the Bi-Metallic, which is capitalized at half the number of shares—200,000.

NEW MEXICO.

GRANT COUNTY.—Silver City *Enterprise*, Oct. 10: E. M. Hand of Silver City, a well-known assayer, has investigated the Organ mines in the interest of the railroad scheme. He was much pleased with the camp and his report will doubtless be favorable.

GOOD PROSPECT.—*Southwest Sentinel*, Oct. 14: There is a fine prospect of a mining boom in the vicinity of Albuquerque. A prospect hole on the eastern slope of the mountains, whicb bas been worked more or less during the last six years, has struck ore of a fine quality, and returns just received from a mill-run but recently made in Denver, show that it nets about $300 a ton.

UTAH.

BINGHAM NOTES.—*Stock Exchange Journal*, Oct. 14: The Mary M. Co. was organized yesterday and articles of incorporation will be filed to-day. The property of the company is located in Carr Fork gulch, Bingham, Utah, and is already a producing mine. The company is now taking out ore that assays from $16 to $80 in gold and 8 to 10 ounces in silver to tbe ton. The mine has a brilliant future before it inasmuch as it bas an immense body of the needful—rich ore.

VEINS OF MICA.—D. C. Robbins, wbo has prospected Emery county very carefully, reports the discovery of 13 veins of pure mica hetween Huntington and Price. The veins run from 2½ to 4 feet in width, and have well-defined side walls.

TINTIC.—*Inter-Mountain Mining Review*, Oct. 10: Chas. Saviers will soon begin a vigorous campaign of development on the North Star group near Eureka. The Iron mine near Silver City is again working. The property has so much ore in sight that continuous work of 10 men would glut the market. There is no limit to its production. The Soutb Galena of Bingham is doing as well as it ever has in its history. The concentrator is running at its full capacity, and saving above 90 per cent of the assay value of tbe ore. Judge Dana, one of the owners of the Governor mine in Dragon bollow, Tintic, was in this city several days the past week, jingling about $16,000 in coin of the realm in bis pockets as his share of the proceeds of the sale of tbat property.

TINTIC MINES.—Eureka *Chief*, Oct. 20: Jupiter group is looking splendid. Shaft down about 25 feet. A fine new engine is being set up at tbe Caresa. The ore output from this mine will now be greatly increased. Some black manganese at tbe Governor, considered worthless, was assayed this week and gave 100 oz. silver and a high per cent in copper. The force bas been increased here, a new shaft is being sunk, tbey are making a new road to the mine, and putting up a boarding-house, shops, etc. An engine will soon be put up. The mine is looking better than ever and promises to develop into a regular bonanza. An assay of ore from the Wolf, in the Spy country, gave 46 per cent lead, 17½ oz. silver and $3 in gold. Assay from tbe top. A cave was struck in the General Logan this week and an assay sbowed about six ounces of silver and a trace of gold. Tbe boys are pushing development work and are confident that tbey will soon have shipping ore.

WASHINGTON.

A KING COUNTY MINE.—Seattle *Press*, Oct. 9: Judge J. Luttrell Murpby has just received returns from the ore shipped from the Snoqualmie Pass Gold, Silver and Marble Mining & Milling Co.'s mines, in Snoqualmie Pass, a few days ago, to the Tacoma Smelting & Refining Co. The test is highly satisfactory. Judge Murpby says be thinks that King county can soon enter tbe contest for the banner mining county of the State in precious metals.

WESTERN WASHINGTON.—Mr. George Milliken, the mining and mineral expert of the Northern Pacific railroad, said to a *Press* reporter: "I bave just returned from the Silver Creek mining district up in the Cady Pass. I have spent a deal of my time tbis past summer examining the mining resources of the Kootenai and Okanagon districts in Eastern Washington. True, there are some very valuable and promising mines in each of those localities, but I must admit that Western Washington, particularly the Silver Creek district, far surpasses either of those. I am astonished at the wonderfully rich galena ledges carrying silver."

COAL AND COPPER. — Port Townsend *Ledger*, Oct. 2n: D. M. Young, who with three others bas been out on a prospecting tour for nearly three weeks, returned home last night with some splendid specimens of coal and copper. The specimens he brought were discovered 22 miles from Port Townsend, and at an elevation of 1500 feet above the sea level. The coal was taken from the surface croppings, and is of so fine a quality that it will burn readily. The ledge is six feet thick. Some fine copper croppings were also picked up from a three-foot ledge.

WYOMING.

ORE, OIL, ETC.—Laramie *Republican*, Oct. 13: Two mining syndicates have been organized at Buffalo to send prospectors into the Bald Mountain district. Caspar has another oil well, struck on the 6th inst. Great excitement prevails and land locators are out in all directions. Fremont county's mining boom still continues and prospectors are still flocking toward that regiou. A Douglas syndicate, headed by James Bury, has put in a five-stamp mill at Miners' Delight at a cost of $7500. Emil Granier has spent a big sum in strengthening the dam used in his hydraulic mining operations. He has already invested nearly $1,oon,ooo in the district. The Rose mine, the new strike of the Davis boys, who sold a claim to Senator Tabor, is looking well at 25 feet. They have contracted for a 60-foot shaft and a drift of 50 feet. Several claims that were abandoned 10 to 15 years ago have been reopened, notably the Clipper, whicb discloses a fine ore body.

Mining Share Market.

Mining shares, so far as the Comstocks are concerned, ruled quiet with a strong, healthy tone. On yesterday (Wednesday) the market began to show more activity, resulting in better prices this morning under the leadership of Con. Virginia, Alpha and Best and Belcher. The advance in these stocks is said to be due to the important character of the work going on, and a few brokers seeing a good opportunity of turning an houest (?) penny on a bull movement, owing to the return of Senator Jones to the coast and the arrival ot Col. Mackay in New York. In outside stocks the Bodies made quite an advance, but to-day they are weak and lower. The Quijotoas have been active at a slight advance. The Tuscaroras liave hung around last week's prices.

One of the most favorable signs of the times is the election of W. H. Hobart, the millionaire mining operator, as a director of the Exchequer Mining Co. This move shows that large operators are beginning to come to the front, so as to give personal attention to the workings of the mines. It is only a question of a short time when they will be convinced of many needed reforms in mine management. Mr. Hobart's example should be followed by others.

The Andes Mining Co.'s affairs have been amicably settled. It now turns out that there was a tempest in a teapot, and nothing more. Previous to J. W. Brown securing control of tbe mine, the annual assessments averaged $75,000. Under Mr. Brown's two years' administration, only two assessments of $25,000 each were levied, and more work was done than ever before.

From the Comstock mines our advices report very important work to tbe west in Gould & Curry. In Best & Belcher and Sierra Nevada the work is of an important character. In Alpha and Exchequer the west work ougbt to begin to show good results soon. In Confidence work is under way to tap on the 1000-foot level, the rich strike made some time since on the 800-foot level. In Crown Point very interesting work is under way. Extensive prospecting work is being done in Con. Imperial, Yellow Jacket, Savage, Chollar and Hale & Norcross. In Kentuck the work continues of the most encouraging character. More prospecting work is being done in Andes. In West Con. Virginia work has been resumed. A shaft is being sunk preparatory to deep mining for the purpose of prospecting the very rich development made hy Con. Virginia in its west workings, and also by Ophir on its 700-foot level. Work in all the mines is to the west to tap the Red lode we have persistently advocated.

From outside districts our advices are still of an encouraging character from the Quijotas and Tuscaroras. From the Bodie district our advices report the ore in Bodie in the winze below the 700-foot level going from $50 to $75 a ton. On the 400-foot level the grade is mucb bigher. The work in all parts of the mine is of rather an exciting nature. A remittance has left the mine and is expected to arrive here to-morrow (Friday). It is said to be quite large. Private advices received to-day report a $40 strike in Bulwer.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of snbscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its valne more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a snbscriber, please show the paper to others

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THERE is said to be a district on the borders of Death Valley that abounds in gold, silver, lead, copper, antimony, iron, soda, borax and salt.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 14, 1890.

438,223.—WASHING MACHINE—M. K. Biser, Los Angeles, Cal.

438,593.—INSECTICIDE—Giles & Brown, National City, Cal.

438,251.—WIND ENGINE—John Harder, S. F.

438,417.—STICKY FLY PAPER—E. Krull, S. F.

438,482.—CHURN—E. D. Middlekauff, Stockton, Cal.

438,273.—TRICYCLE — A. E. Miller, Sprague, Wash.

438,355.—VERGE WIRE FOR CLOCKS—J. M. Miller, Vacaville, Cal.

438,360.—HARNESS—J. R. Phelps, Sacramento, Cal.

438,177.—PIPE TONGS—J. M. Pray, Los Angeles, Cal.

438,178 — SKIRT-MEASURING APPLIANCE—J. F. Prizgint, Los Angeles, Cal.

438,362.—TIRE TIGHTENER—G. C. Richards, Sissons, Cal.

438,243. — WRENCH — H. Scheatzka, Bothell, Wash.

438,259.—CABLE RAILWAY—J. C. Shelley, Stockton, Cal.

438,449.—THROW-OFF FOR CABLE-GRIP—T. W. C. Spencer, S. F.

438,455.—LAMP-SHADE SUPPORT—O. F. Wegener, Seattle, Wash.

The following brief list by telegraph, for Oct. 21, will appear more complete on receipt of mail advices:

California—John W. Gentry, aeeignor of one-half to J. Jacob, Oakland, railway-cable grip; John Hatch, San Francisco, safety device for elevatore; Enoch Lawson, assignor of one-half to P. Leprohon, San Francisco, pipe coupling; William J. Herson, Stockton, assignor of one-half to C. D. Harson, churn; David D. Jones, aeeignor to W. C. Anderson, San Jose, fruit-dipping apparatus; John Kueffer, San Francieco, assignor by mesne aeeignments to American Indicator and Improvement Company of California, automatic mecbanism for etation indicator in railway cars; Morris Lachman, San Francisco, sewing-maobine; Ernest E. Lommatzsch, San Francisco, toy target; Abraham Morris, San Francisco, child's bed-lounge; Albert S. Morton, Suisun, wine-cooler; Chester W. M. Smith, San Francieco, metallic railway-car; Gottlieb Spicese, San Francieco, razor-strop; John C. H. Statt, San Francisco, aseignor to American Bell Telephone Company, Boston, Mass., telephone.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable ratee, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

VERGE-WIRE FOR CLOCKS.—James Munroe Miller, Vacaville, Cal. No. 438,355. Dated Oct. 14, 1890. The object of tbis invention is to provide a means for readily putting the clock in beat whether on a level shelf or not. It consists of a jointed verge-wire, the fulcrum of which is movable, and a lever for shifting this movable fulcrum. When the clock is out of beat, by turning the lever to one side or the other, as may be needed, and therehy shifting the fulcrum of the verge-wire, the sections of said wire are slightly cbanged in position and made to conform to the position and throw of the pendulum wire, while keeping the verge itself in proper position to be operated by the scape-wheel. The end of the lever is within convenient reacb of the operator.

TIRE-TIGHTENER.—Geo. C. Richards, Sissons, Cal., assignor of one-half to Wm. T. Tuckwell, Sissons, Cal. No. 438,362. Dated Oct. 14, 1890. This invention belongs to that class of adjustable spoke sockets in which the spoke is adjustably connected with the felly, said adjustment being controlled and operated hy a nut, the effect of which is to vary the length of the spoke, whereby the tire, the felly, and the spoke are tightened. It consists in a felly having a socket, a spoke having a tenon fitting in the socket, a protecting plate fitting around the spoke-socket and extending up on each side of the felly, a sleeve on the spoke-tenon having a head provided with a concave seat which receives the convex portion at the base of the tenon, a nut upon tbe threaded portion of the sleeve having a flange on its under surface and a split wasber between the nut and the head of the sleeve.

HARNESS.—James R. Phelps, Sacramento, Cal. No. 438,360. Dated Oct. 14, 1890. The purpose of this device is to give a trotting, pacing or running horse a proper gait and cause bim to spread the hind feet when traveling so as not to interfere or overreacb. It consists of a frame-work supported from the back or bips of the animal, and connections from said frame-work to the bind legs of the borse with such an elastic tension as will cause the animal to travel with the bind feet more widely separated than it would otberwise do.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by tending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Vodoc and Laeeen Cos.
T. B. LESIEUR—Humboldt Co.
GEO. WILSON—Sacramento Co.
J. P. QUINETTE—San Francisco.
J. C. HOAG—San Francisco.
SAMUEL CLIFF—San Luie Obiepo Co.
W. W. THEOBALDS—Loe Angeles Co.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
W. B. FROST—Marin and Sonoma Cos.
GEORGE EVANS—Santa Clara Co.
MRS. M. E. DUDLEY—Ventura Co.
ANDREW REID—Monterey Co.
B. F. BELT—Shasta Co.
FRANE S CHAPIN—Colusa Co.
HENRY STAORY—Oregon.
WM. M. HILLEARY—Oregon.
JOHN SIMPSON—Oregon.
WM. HOLDER—Oregon.
R. G. HUSTON—Montana.

MECHANICAL PROGRESS

Reduction in the Price of Aluminum.

The recent announcement of the Cowles Electric Aluminum Company that they have reduced the price of aluminum to $1 per pound marks an event of unusual interest in the history of this remarkable metal.

But a few years ago this needful metal could not be profitably produced for less than $20 per pound. From that time until some three years since the price was gradually reduced by economies and improvements in its manufacture to $2.50. Improvements have since been still going on until the price is now reduced to $1 per pound.

Quite recently Prof. Joseph M. Hirsh of Chicago, as has already been stated in these columns, announced his readiness and determination to put up aluminum works in Chicago with which he could produce the metal by a new process for less than 25 cents per pound.

This announcement was generally received as a fraud, but since that time it has been stated by the Chicago press that the professor has actually put up works in that city and has manufactured 2000 pounds of aluminum already, and that when the works are fully completed they will have the capacity of turning out one ton of the metal per week. The process is claimed to be entirely new and no infringement on any patent or process hitherto employed.

In a recent interview Prof. Hirsh said: "I have solved the problem of extracting the metal from an aqueous solution, and the process has been so simplified that it is surprisingly cheap and requires but little labor. Pure kaolin or clay contains 53 per cent of aluminum. From the clay which I am using I can get 16 3 5 per cent metal."

The professor also said that the Thompson Patent Car Company has already arranged to construct four sleepers of aluminum for the Baltimore & Ohio Railroad Company.

It is claimed that at 50 cents per pound aluminum would become a formidable competitor with copper. The Cowles Company is one of the largest manufacturers of aluminum in the world, if, indeed, they are not the very largest, and to their success is due the gradual reduction of its cost.

As the metal is of so recent introduction in commercial quantities, and at a price not warranting extended experiment and use, the present field of application is as yet somewhat limited. But this field will rapidly widen with the cheapening of production. At the present price of $1 per pound, aluminum is already a serious competitor with both nickel and tin. Judging from the continual and rapid fall in price in the last five years, the lowest price has not yet been reached.

An alloy of aluminum with tin is something new which has recently been announced. This alloy is formed by fusing together 100 parts of the former with 10 parts of the latter. This alloy is paler than aluminum and has a specific gravity a little heavier than the pure metal, but not too heavy to be formed into parts of instruments intended to be very light. The alloy is not so easily attacked by the several reagents as pure aluminum is, and it can also be worked more readily. Another great advantage of it is that it can be soldered as easily as bronze without further preliminary preparations. There can be no question but that there is a great field opening up for this metal in the near future.

A Machine to Drill Square Holes in Iron.

A machine has recently been invented in England to drill square or hexagonal holes. In fact, two such machines have been patented, one called the Ainley-Oakes drilling machine, which in appearance resembles an ordinary drilling machine. It has, however, a spindle composed of three concentric parts, upon one of which is a set of cams so arranged that each cam, when brought into combination with the part in which it works, produces at the cutter a hole of a given size, each cam producing a different sized hole. In other words, in cutting a square hole, the toe of the cutter describes a square. It is not possible without drawings to make the arrangement clear, but it may be stated generally that the mechanical details, while very ingenious, are very simple, and the results very satisfactory.

The second machine is the Tyler-Ellis drill, which is an outcome of the previous apparatus. In the Tyler-Ellis machine the spindle moves about the center of a ball joint, and by an improved arrangement of the working parts, holes of any conceivable mathematical outline can be drilled. It also cuts clean angles in the square holes, while the Ainley-Oakes drill leaves a slight filling of metal in the angles, which has to be cleared out after the hole has been drilled. It is curious to watch the machine forming a four-sided hole in a plate of metal, but it does it in a very practical and effectual manner.

The value of these machines, says a contemporary, will be found in engineering workshops and shipbuilding yards, where great numbers of square holes are constantly required to be made in various parts of machinery, and would be much more frequently made were the means at hand for forming them. It is stated that the cost of drilling square holes is no greater than that of round ones, although up to the present time the cost has been as 1 to 36, that is, a square hole has hitherto cost 36 times as much as a round one.

A New Mode of Manufacturing Netting.

A new mode of manufacturing netting by slitting and expanding sheet metal has been devised in England. The article produced is quite dissimilar to other manufactures of the kind.

The product is called expanded iron. According to London *Iron*, the process of manufacture consists in the employment of a machine which so operates on a sheet or strip of metal as to slash it at intervals in parallel lines, so as to leave uncut spaces, which serve to maintain the connection between all the strands produced by the act of slashing. The method by which this slashing, as well as the opening up of the sheet or strip into meshes, is performed, is peculiar, and one which makes it possible to transform the sheet or strip of metal into a finished article at one operation, and to this achievement is due the great commercial value of the invention. The simultaneous act of slashing and opening, or expanding the sheet at the slashes, leaving uncut spaces, and giving uniform design and set to the metal forming the meshes, is novel and difficult of explanation, except by witnessing the movements of the machines. Any homogeneous metal, such as steel, copper, brass, etc., can be employed. The machines automatically feed a strip of steel between their cutters, which simultaneously slash and expand the metal into meshes. These strips may be of any width, from one to eight inches or wider, the ratio of expansion being determined by the size of the mesh. Thus a strip of steel seven inches wide by nine feet long, made into ⅝ inch mesh for lathing, gives as a result a sheet of finished product, 18 inches wide and about five per cent shorter than the original strip, whereas a strip of metal six inches wide and nine feet long, made into a four-inch mesh for fencing, gives as a result a finished sheet four feet wide by eight feet long. The cut edges of the strands forming the meshes are presented to the surface in the finished sheet, thus giving rigidity to the expanded sheet many times greater than the original flat sheet or strip.

AN ELECTRIC PROCESS FOR MAKING WROUGHT IRON.—A process of making wrought iron from pig metal without puddling is one of the discoveries made by Dr. Emmens of Greeneburg, near this city. The doctor accomplishes his object with the aid of electricity. He takes a vat which is filled with a chemical solution and a number of thin sheet-iron plates. Then the pig iron is also placed in the vat, after which the pig iron and the sheet iron are connected with a dynamo. The current generated by the dynamo is said to have the effect of causing the pure iron to be separated from the impurities in the pig iron and form a deposit on the sheet-iron plates. The quality of this wrought iron is stated to be superior to that of the best Swedish metal. It can be bent, rolled or twisted into any shape while cold. Dr. Emmens says that he can take a horseshoe nail of this iron, fasten the head in a vise and twist it into an almost perfect screw without breaking. —*N. Y. Electrical Engineer.*

THE POPULARITY OF AMERICAN WIRE WORK SCREENS.—The sudden popularity of American made wire-work screens for offices, churches, household and other purposes, in South America, South Africa, Australia, and in other distant countries, is not surprising, remarks *Engineering and Mining Journal*. It meets all the requirements of hot climates, where the free circulation of air and the admission of light are essential, and it affords also a pleasing effect on the eye. To such an extent has this development of the old wirework gone that hundreds of patents have been granted for processes and mechanisms of manufacture. As it stands to-day, it is practically a new industry built upon the old one of iron wirework. Dozens of factories are occupied in the work, and many artists are vying with each other in evolving new, quaint and beautiful or curious designs, to the oddity of which there is no limit, and in which ingenuity is not sought.

A NOVEL KIND OF STEAM ENGINE is described, which dispenses with piston-rod, crosshead and wave, and is claimed to reduce friction to the lowest possible point. It has an oscillating piston sustained in a journaled bearing, and turns about one-fourth of a revolution to each stroke of the engine, the only friction outside of the shaft to which the rock-cranks are attached being a slight pressure on the packing strips to keep it steam-tight. The operation of the engine is in every respect satisfactory.

IN THE MANUFACTURE OF SHOVEL-HANDLES, it is said that a large proportion, usually about 75 per cent, are split or broken in the process of bending, which loss has led to the invention of a handle-bending machine. The saving effected may be estimated from the fact that in a trial lot of 25 dozen put through the machine only one handle was spoiled.

A MONSTER GUN, 50 feet in length, with an inside diameter of 15 inches, and weighing about 40 tons, has been cast by the West Point foundry for the Pneumatic Gun Company, and having been successfully tested, will soon be shipped to Australia.

SCIENTIFIC PROGRESS.

Electric Research.

"Light is an electric phenomenon in its very essence; the light of the sun, as well as that of a candle or glow-worm. Suppress electricity in the universe, and light disappears; suppress the luminiferous ether, and electric and magnetic forces no longer exert any influence through space."

Such was the thesis of a paper read by Prof. H. Hertz before the recent Medical Congress at Heidelberg. The relation existing between electricity and light was suspected by Faraday, and was by him investigated, without material results, however. Next, Clerk Maxwell presented his "Magnet'e Theory of Light," which fell just short of proving the truth of his theory. Many others have also theorized over this belief without coming to any definite conclusion, though startlingly near its solution.

It was, of course, on the suggestions of his predecessors that Prof. Hertz based the experiments that seem, if not to prove the identity of electricity and light, at least to give logical reasons for his belief in that identity.

If by means of electrical waves we can succeed in producing phenomena similar to those of light, the identity of the two would seem to be proved beyond a doubt.

One of Prof. Hertz's experiments consisted of placing the conductor which produces the variation of the electric condition in the focus of a large concave mirror. The electric waves are collected and issue from the mirror in the form of a rectilineal bundle. We cannot, it is true, either see or touch this bundle, but we know that it exists because we see sparks passing over from it to any conductor it may meet. It becomes perceptible when we arm ourselves with our electric resonator. All these properties are those of a luminous ray.

Starting from the domain of electricity, pure and simple, we have, when we admit the truth of the above experiments, landed squarely in the domain of ethics, and "the identification of light and electricity, suspected by science," says Prof. Hertz, "foreseen by theory, is definitely established; it has become perceptible to our senses, intelligible to our minds." The paper concludes somewhat in this fashion: "We shall see henceforth electricity in a thousand circumstances where we did not suspect it before; each flame, each luminous atom, becomes an electric phenomenon. Even when a body does not give off any light, provided only it radiates heat, it is the source of electric action. The domain of electricity thus pervades all nature—it pervades ourselves; in fact, is not the eye an electric organ?"

On the Cause of Trade-Winds.

Maury's theory on trade-winds was formed at a time when the materials on hand of actual observations were very scanty. His theory was that the trade-winds, after having blown across the earth's surface, are supposed to rise to a higher level, there to pass through each other and then come down again to the surface as anti-trades (having changed their direction in the meantime owing to the earth's rotation), as if it were possible to imagine that the wind could blow at any point in two opposite directions at the same time.

At the beginning of the present year, Frank A. Veleohow, as per his communication in a late issue of *Mechanics*, formed another theory which seems to meet the case in a more convincing manner. His general conclusions are as follows: (1) The surface air becomes dry by resting over the large arid zone lying north and south of the equator and is formed into cushions of dry air which are ultimately thrown westward over the surface of the ocean. (2) By getting cooled down over the sea-surface the dry air appears there as centers of high pressure, which are kept up or fed by the continual flow of dry air from land which circulates round these centers of high pressure. (3) The trade-winds in each of the five oceans are, therefore, each of them one continual current of dry surface air issuing from a dried-up land district lying to the east of them. (4) The direction of the circulation does not depend upon the earth's rotary motion, but upon the interposition of the centers of high pressure and the corresponding dried-up land districts, the former always lying a little farther from the equator than the latter.

As the dry air which causes the whole trade-wind motion is produced over the dry land surface and consumed or saturated by evaporation in the centers of high pressure over the oceans, it will be observed that there is a certain natural sequence in the explanation given, and it enables us to trace the trade-winds from their place of origin to where they ultimately die out.

It goes almost without mentioning that these continual trade-wind currents set the surface of the underlying oceans in a similar gyratory motion, and thus aided, as they are, by the shape of the adjacent coast-lines, become the principal cause of a certain class of ocean currents, more particularly the Gulf Stream.

The earlier observations on which Maury's theory was founded were mostly made by seafaring people who had no opportunity to compare them with the winds over adjacent land surfaces. The more complete observations now attainable, which have been thoroughly studied and largely observed by Mr. Veleohow, which are also free from any serious objectionable points, render his conclusions much more acceptable than those of Lieut. Maury.

ELECTRICAL WONDER WORKING.—One of the chief ends of popular electrical education, says the *Electrical World*, is to eliminate a certain sort of credulity. The popular idea of electricity is to look upon it as some mysterious force, coming from nowhere in particular, doing very nearly what it pleases, and equally able to produce a spark and a general disruption of the universe. There is a tendency on the part of certain people to contemplate it as an African doctor his gree-gree—a wonderful and ineffable something that need only be invoked to produce almost any result that can be named. This spirit has, perhaps, hastened the march of electrical industries, but it is certainly unworthy to encourage it. The sooner people are brought to look upon electrical power as only one of the Protean forms of energy, as subject to known laws, and quite transformable into other kinds of energy, the better for everybody concerned. To be sure we do not know what electricity is; in fact it is quite probable that it is not a separate entity at all; but on the other hand we do not know what the force we call gravitation is. Yet the actions of both under given conditions can be foretold with considerable accuracy, and perhaps we should not be able to do much more with them if Nature should yield up her profound secrets and set the unquenchable curiosity of man at rest. Look at electric energy as a force obedient to certain laws, known and unknown, able to accomplish much in skillful hands, but do not imagine it as ready to do all sorts of marvelous things without any particular method in its madness.

EXPLORING PARTIES.—A bill introduced in the House of Representatives provides that the Secretary of War be authorized to send an expedition to the interior of Alaska for the purpose of making a thorough exploration and survey of that Territory, with a view of ascertaining its resources and capabilities. It is proposed that the party sent out should locate near the center of the Territory, and from that point as a base, push expeditions into all parts of the interior. The party is to remain not less than three years. In this way a thorough knowledge of the topography and other features of the country may be gained. An appropriation of $100,000 is asked. Another exploring party, under charge of Prof. Lumholtz, a Norwegian explorer, famous among geographers by reason of his expeditions in Australia, is about to explore Lower New Mexico and Arizona under the direction of the American Geographical Society of New York. About a dozen scientists, archæologists, botanists and zoologists will accompany him. The special object of the expedition is to examine the remains of ancient civilization, antedating, it is said, that of the Aztecs, and existing principally in the Gila valley, in the northwest part of Arizona. The peculiar habits of the Zuni and Navajo Indians will also be investigated.

WHAT DYNAMITE CAN DO.—Shooting a candle through a two-inch solid plank without disturbing it in the least is being done by dynamite, which is so quick in its action that the tender green leaf can be compressed into the hardest steel before it has time to flatten. One of the experiments of the United States Torpedo Works was to place some leaves between two heavy, flat pieces of iron, set them on a firm foundation and see what gun-cotton would do in forcing the iron pieces together. The reaction was so great from just being exploded in the open air that one of the iron pieces was driven down upon the other quick enough to catch an exact and complete impression of the leaves before they could escape. It is also a singular fact that the gun-cotton itself should sink deep into the iron when it explodes, showing the points of the letters stamped into the cartridges. This novel method of engraving by gunpowder is one of the wonders of the century.

TREES SIX HUNDRED AND FIFTY FEET HIGH. "What do you think of trees 650 feet high?" said Prof. F. O. Plummer to the editor of the Olympia *Tribune*. "They are to be found," continued the professor, "that high in the uncurveyed township near the foot of Mt. Tacoma; and what is more, I have seen them and made an instrumental measurement of a number with that result. There are lots of trees near the base of Mt. Tacoma whose foliage is so far above the ground that it is impossible to tell to what family they belong, except by the bark. Very few people know or dream of the immensity of our forest growth. I wish that some of our large trees could be sent to the World's Fair at Chicago. We could send a flag-pole, for instance, from 300 to 400 feet long."

BLEACHING BY FUMES OF BURNING CHARCOAL. Instead of bleaching by fumes of burning sulphur, as at present practiced by wool-bleachers, Brownen and Gamgee patent the burning of bisulphide of carbon in suitable lamps. Sulphur or brimstone, when burned with sufficient access of air, produces sulphurous acid; the bisulphide of carbon, when completely burned, produces a mixture of sulphurous acid and carbonic acid.

USEFUL INFORMATION.

PAPER BARRELS.—Much study and experiments have been given to the production of a thoroughly practical paper barrel. It is thought that this result has been most successfully reached by an English company whose barrels are now largely used for the carriage of gunpowder, mining fuses, fruit, flowers, molasses, paint, cement, matches, chemicals, dyes, asbestos, sugar, size and extract of meat. The materials used in making the barrels are waste paper, cardboard and (for the better quality) old sacks. When cardboard is used it is soaked or boiled for six hours and afterward treated in the same manner as the other raw material. This is carefully sorted and put into a rag engine or beater, where it is beaten and torn to pieces by a series of knives for about an hour and a half. It is afterward mixed with water until a pulp of uniform consistency is gained. This is rolled, joined, shaped and dried, and the barrel is finally covered with hoops. Before the tops and bottoms are put in, the barrels are painted with a waterproof composition, made of linseed oil and rosin for ordinary-purpose barrels, and with a special varnish where they are used for food products. The standard size made is 16½ inches in diameter by 28 inches long. The price at which these barrels can be produced enables them to compete favorably with wooden barrels; a barrel costing 34 cents in wood can, when made of paper, be sold for 28 cents. One great feature is that there is no waste with the process, all "wasters" being beaten up into pulp again.

CLEANING FILES.—A new method of cleaning files, which is claimed to well-nigh restore them to the condition of new ones, is described as follows: After being cleaned and wetted, the files are dipped between two carbons into acidified water and the circuit of an electric current is established between the carbons and the files by means of a piece of metal serving as a support to the file by which the latter is suspended. The water is then decomposed by the current, the oxygen acting upon the cuttings of the file, while the hydrogen bubbles settle on the teeth and protect them against the action of the acidified water. After immersion for a few moments the file is withdrawn and brushed in clean water to remove the oxide of iron, and then replaced in the bath. When the cuttings are entirely cleared the file should be immersed in an alkaline bath to remove all traces of the acid, then dried and brushed.

WHY DOES A TOP STAND UPRIGHT WHILE SPINNING?—Says a cotemporary: Speaking of the difficulty of explaining some problems, we once heard an engineer say that the hardest problem he had to explain was why a top in spinning stood upright. The popular notion is that it is all due to the centrifugal force of the revolving top keeping it erect, whereas this is not the case. The top holds its position erect because gravity, which tends to pull it over, does not act quickly enough. It takes time for gravity to act, and the center it would work on has passed before it has time to act, and so it continues until the motion of the top comes slow enough for it to act. But how to explain it all in a simple manner was the difficulty.

HOW TO SWEEP A WOODEN FLOOR.—We don't use a leaky old sprinkling-pot to sop the floor all over in puddles when we sweep. No, sir! We have wet sawdust, and I put a row of it across one end of the store and sweep that right along to the other end, just like a regiment marching across a ten-acre lot. It catches all the dirt and carries it along. If it gets a little dry, I add some more. Some folks scatter sawdust all over the floor, but Mr. Vanders says that's no good; that the reason for using sawdust is to avoid wetting the floor all over and to have something that will absorb the dust.—*Cin Enquirer.*

BY COVERING BULLETS WITH VASELINE they may be easily seen in their course from the rifle to the target. Their trajectory course is marked by a beautiful ring of smoke, caused by the vaseline being ignited on leaving the muzzle of the gun, the smoke being suspended for some time in the air, if not too windy.

HOW TO KEEP FLIES FROM PICTURE-FRAMES. Boil three or four onions in a pint of water; then with a gilding-brush go over the frames of your picture and chimney glasses, and rest assured that the flies will not alight on the articles washed with the solution. It will do no injury to the frames.

THE VALUE OF PATENTS.—The United States Government Commissioner of Patents estimates that from six to seven eighths of the entire manufacturing capital of the United States, or $6,000,000,000, is directly or indirectly based on patents for inventions.

A GOOD FURNITURE POLISH.—An excellent furniture polish, for everything but a piano, is made by mixing three parts of alcohol shellac varnish with one part of boiled linseed oil. Shake well and rub briskly while applying.

RAIL ENDS FOR MINE TIMBER.—A patent for employing iron and steel rail ends, defective and new rails as pit and mine props, supporting pit, mine and other shafts, circular and rectangular, for tunnels, bridges, pithead gearing and structural work, has been obtained by Mr. W. Wilson Barnes, mining engineer of Harrington, Eng. The application is simple and easy, and will probably admit of another outlet for waste and other rails.

GOOD HEALTH.

The Health of the State.

The monthly report of the State Board of Health is before us, from which it appears that mortality reports received during the month of September from 85 different localities throughout the State, with an estimated population of 705,309, give the number of decedents as 920, being an annual mortality at the rate of 15 6 per thousand, which is a considerable decrease from the previous month. The mortality from cholera infantum has in a marked measure decreased, as also have diseases of the respiratory organs.

Prevailing Diseases.

Reports of sickness from 98 localities throughout the State continue to indicate a very favorable condition of the public health. It does not appear from any of them that epidemic disease of any description is present anywhere in the State. Bowel disorders are quite prevalent, as might be expected at this season, when fruit is indulged in without regard to quantity, and very often to quality. The cooler weather of the month past has had a beneficial effect in lessening the frequency and fatality of summer diarrhea in children.

In regard to diphtheria and croup, the report says that a serious outbreak occurred in the Protestant Orphan Asylum at Sacramento, in regard to which the report says: "We cannot too earnestly impress upon the authorities that each case of such disease is a public danger, against which the public, as represented by its local sanitary authorities, is entitled to be warned by proper information, and we believe that where an institution like the orphan asylum is the seat of epidemic contagious disease, it is the duty of the local sanitary officer to visit such institution and have it properly disinfected under his personal supervision. Such disinfection should not be intrusted to those ignorant of the precautionary duties required, or left to the chance of a superficial sprinkling of carbolized water about the room as a sufficient remedy to destroy the germs of the disease. We believe that much of the diphtheria that exists is dependent upon insufficient disinfection where a case occurs. The germ we know is most tenacious of life, and except the most skilled disinfection is exercised, will continue to live and propagate its hateful existence for an indefinite period of time. We should therefore require all health officers to see to this matter themselves, and know that through their exertions all ordinary precautions have been taken to insure immunity to the public under their charge."

Typhoid Fever and Milk.

Typhoid fever appears to be increasing in many localities, in regard to which the report says: "Its prevention simply requires perfect cleanliness about persons and premises, and constant watchfulness in regard to the sources of supply for drinking water. All suspected water should be boiled. Numerous instances are recorded when typhoid fever has been spread from the rinsing of milk-cans with water apparently pure but really infected with the germs of typhoid fever capable of infecting the milk. We have no doubt that many of the cases of typhoid fever which have baffled our research for their origin have arisen in this way. Most of our dairies have their water supply from wells sunk in the cow-yard where they receive the drainage from the polluted soil. It is a matter of history that cattle themselves suffer from a disease analogous to typhoid fever if not the identical disease itself. It would, therefore, be an act of prudence on the part of our health officers to visit our dairies and examine the source of their water supply and the means used in keeping the milk from pollution. Milk from an unknown or a suspicious source should be heated to the boiling point before using, as thus is effectually destroyed not only the germs of typhoid fever but likewise the germs of consumption, which are very commonly conveyed through milk taken from tuberculous cows."

THE ART OF BREATHING.—In each respiration an adult inhales one pint of air. A healthy man respires 16 to 20 times a minute, or 20,000 times a day; a child 25 or 35 times a minute. While standing, an adult respiration is 22 times a minute; while lying down, 13. The superficial surface of the lungs, *i. e.*, of their alveolar space, is 200 square yards. The amount of air expired every 24 hours is about 10,000 quarts. The amount of oxygen absorbed in 24 hours is 500 litres (about 744 grams). The amount of carbonic acid expired in the same time is 400 litres (911.5 grams). Two-thirds of the oxygen absorbed in 24 hours is absorbed during the night hours, from 6 P. M. to 9 A. M.; three-fifths of the total is thrown off during the day. The pulmonary surface gives off 150 grams of water daily in the state of vapor. An adult must have at least 360 litres of air in an hour. The heart sends 800 quarts of blood through the lungs every hour, or about 5000 daily. The duration of inspiration is five-twelfths of expiration, seven-twelfths of the whole respiratory act. During sleep, inspiration occupies ten-twelfths of the respiratory period.

ENGINEERING NOTES.

Ocean Steamship Racing.

It is difficult for the general public to understand why the competition for time is kept up so lively between the steamship lines between New York and Liverpool. The margins are so close—sometimes a difference of only a few minutes in a voyage of 3000 miles—that there is a suspicion in regard to the honesty of the time-keeper. Of course the rapid shortening of the time by days and hours within the past few years indicates the rapid strides that are being made in the science of steamship building and steamship navigation as compared with the use of steam on land. Imagine two locomotives with their respective trains making a forced trip between this city and New York (3000 miles) and coming in within 14 minutes of each other!

But there is another view which seems to be taken of this matter by our Government and the steamship companies. According to an authority which ought to be unimpeachable—the manager of one of the European steamship companies—the rivalry among the various lines in making short passages across the Atlantic is really a struggle for precedence in carrying the United States mails. Where rival lines go to the same port, the United States mail is sent by the fastest vessel. This is ascertained by taking the average speed made by a vessel during her last three trips. The logs are sent to the postoffice, and there the average speed is determined. So eager is this rivalry, and so close are the records, that one vessel of the White Star Company may carry the mail one trip and her rival of the Iuman line the next. This has repeatedly happened during the last summer. As averages are computed each trip, the difference of a few minutes means the loss or gain of valuable freight. The safety valve prevents crowding steam beyond the limit fixed by Government inspectors.

Is not this action of our Government encouraging ocean-steamship racing to a dangerous point? Are the lives of the thousands of passengers, who are constantly crossing the ocean in these steamers—an ocean often rendered very dangerous by thick fogs and towering icebergs—of less consequence than the delivery of a lot of mail bags a few minutes sooner than a reasonable safety would admit? This ocean racing, if thus encouraged, may soon become as dangerous as was steamboat racing on our Eastern and Western inland waters before railroads drew off the bulk of rapid transit. The safety valve is supposed to prevent the crowding of steam beyond the limit fixed by Government inspectors—but is the Government inspector always around at the right time?

THE SCIENCE OF NAVAL ARCHITECTURE, so far as ships of war are concerned, appears to have reached a deadlock. Naval constructors have reached the limit of armor which a ship's sides may carry without impairing her seaworthy qualities. Other constructors have cast guns which will pierce that armor and send a shell through it. The limit of caliber for guns to be used on board ships was probably reached in the Italian Duilio and the English Inflexible. Guns of over 110 tons cannot be fired without straining the vessel so as to endanger her sinking. On the other hand, a single shell from a 110-ton gun on shore would convert any man-of-war into a shambles—she would be most effectually *hors de combat.* And, again, the progress of the science of submarine gunnery, as shown in such vessels as the Portuguese torpedo craft and the Vesuvius, renders it reasonably probable that in a short time a small craft not much bigger than a whitehall boat will be able to creep unseen under the counter of the largest ship afloat, pick up all the torpedo nettings, and blow her monstrous antagonist into the air. Under the circumstances, it must be admitted that the construction of navies is rather a disheartening pursuit.

FROM DAMASCUS TO THE SEA.—The Sultan of Turkey has granted to an English company a concession for a railway from the ancient city of Damascus to Acre on the Mediterranean. Several branch lines are also conceded. The main line will be 127 miles long, and will open up to the commerce of the world the most ancient, interesting and one of the most fertile regions on the globe. The harbor of Acre is said to be one of the best on the Syrian Coast. This railroad and the one now in process of construction from Joppa to Jerusalem, one or both of which will, no doubt, soon be continued to the Lower Euphrates valley, and the Indian ocean, will make a close connection between the ancient and modern centers of civilization.

THE CONSTRUCTION OF RAILWAYS in the United States thus far this year, is summed up by the *Railway Age* as being 3782 miles, distributed among 212 lines. Nine Southern States lead in this report with 1443 miles on 65 lines. The total increase of track-laying over that for the same period of last year is 470 miles. The entire new mileage for 1890 is placed at 6100 miles.

THE PANAMA CANAL.—Conflicting rumors are in circulation in regard to what the Colombian Government proposes to do in regard to extending the time for the completion of that work. A few weeks ago it was stated that the time had been just extended for 12 years. Now comes a statement that the Government asks the Panama Canal Company for a very heavy payment for an extension of time on the Colombian canal concession which the company desires, and that it is thought if Colombia persists in the demand, the result will be the final winding-up of the company.

"THE COMING MOTOR."—Will it be driven by steam or electricity—who can tell?

ELECTRICITY.

ELECTRICITY IS NOT MANUFACTURED.—The question that the courts of Pennsylvania have still before them for final settlement—whether or not electric-light corporations are manufacturing companies—is beginning to be a problem also in certain Western cities and provincial towns, where, as in Pennsylvania, manufacturing companies are conditionally exempt from taxation. There is already a number of court decisions holding that electric-light companies do not manufacture anything, for the reason that electricity is not a manufactured product at all, hence they do not manufacture light. This puts the electric companies at a disadvantage in competition with gas companies where the latter are accorded exemption from taxation, and the question will probably be carried to the U. S. Supreme Court for ultimate settlement. In the meantime it is contended that as manufacturing consists of increasing the value of raw material, electric-light companies do not come within the meaning of manufacturing. However, many cities tax electric-light machinery under the manufacturing clause of the tax schedules, and a decision as foreshadowed would exempt in the latter cases.

ELECTRICITY IN FISHING.—It has long been known that light has a strong influence in attracting fishes in deep water. Some very interesting experiments have recently been made in the use of the electric light, which, different from other lights, can be lowered to great depths in the sea. In the course of these experiments, it has been found that the electric light has a large future before it in the fishing business, and particularly in deep-water fishing. At present the cost of miles of line and netting required for a complete fishing plant is very considerable, cumbersome and unwieldy, the latter especially in bad weather. Instead of extensive nets each fishing boat with a small electric-light plant and a few hand-nets would be able to accomplish much more than would be possible with the present cumbersome outfit.

ELECTRICITY AS A BED WARMER.—The latest use for the incandescent lamps, says the *Stationary Engineer*, is one by which it is claimed that the user obtains a large amount of comfort from the lamp during the hours when otherwise it would not be in use. Out in Idaho the ingenious people take the lamps to bed with them on nights when the thermometer is low-spirited. They claim that it serves a better purpose than any of the hot water or heated brick devices commonly used for this purpose, and in sections where meters are not in use for measuring the current, it costs no more to burn the lamp all night than for a few hours only.

THEY ARE OF NO USE.—It is only a few years since a distinguished professor of Johns Hopkins University, in reply to a question from a lady as to the facilities in that institution for the study of the practical uses of electricity, replied: "Thank heaven, madam, they have no use." It is said, however, that no university, *now*, more fully appreciates the value of such studies than the Johns Hopkins; but it must be rather mortifying, in view of the progress of the last 15 years, to think how bitterly that institution opposed such studies at its start.

THE LONGEST TELEPHERAGE LINE IN THE WORLD has just been set up in South America. The overhead electric railway will be 186 miles long, and will connect Buenos Ayres with Montevideo. Its object is to allow of traveling letter-boxes to be dispatched every two hours between the two cities. The line will cross the La Plata estuary in that part where it is 19 miles wide. The two wires there will be supported on either side of the river by two towers nearly 270 feet high.

EXTRACTING TEETH BY ELECTRICITY.—An electrical instrument recently invented for avoiding the pain incident to the extraction of teeth, has attracted considerable attention. Briefly, it consists of adjustable prongs, carrying buttons and connected with an electrical battery. The buttons are placed on the face, over the nerves leading from the teeth to the brain, and a circuit is established the moment the extracting instrument touches the tooth.

ELECTRIC RAILROAD BRAKES.—In England, where particular attention has been given to the subject of electric brakes, it is said that a means has been discovered by which a train going 30 miles an hour can by an electric brake be brought to a standstill in a space of 200 feet.

ELECTRICAL PRODUCTION OF CAUSTIC SODA.—Caustic soda and chloride of lime (bleaching powder) is now produced from salt by means of electricity more readily and cheaper than by the old methods.

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Our latest forms go to press on Thursday evening.

Entered at S. F. Post Office as second-class mail matter

SAN FRANCISCO:
Saturday, October 25, 1890.

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[NEW THIS ISSUE.]

Water Wheels & Rock Breakers—Pelton Water Wheel Co.
Copper Mine for Sale—W. H. Warfield, Madera, Cal.
Assessment Notices—Gray Eagle Mining Company.

See Advertising Columns.

Passing Events.

A continuation of pleasant weather greatly favors mining, farming, lumbering and most other outdoor pursuits, the vintagers and the raisin-makers being especially benefited thereby. With six weeks more of good weather, 10,000,000 feet more of lumber would be added to the Truckee basin cut.

The numbers of voters registered in San Francisco denotes for the city a population of more than 350,000.

The dairy and the stockmen are removing their flocks and herds from the valleys in the Sierra, and the places of summer resort in the mountains are being closed, these various movements having been somewhat hastened by the considerable amount of snow that has already fallen at higher altitudes.

So far this year, 915 people have been killed in the Eastern States by cyclones, half as many more having perished from sunstrokes, lightning, etc.—more than would perish from these causes in California in half a century.

E. O. Leech, director of the Mint, after visiting Colorado and other portions of the West, says the passage of the Silver bill has given a great impetus to mining throughout that region.

Recent measurements made by the party sent out by the U. S. Government to explore the region about Mt. St. Elias show that mountain to be but 13,500 feet high instead of 19,500 feet, as before supposed.

Utility of the Decoy.

With the method adopted for ensnaring wild pigeons in countries east of the Rockies, the native-born Californian is not much conversant. Let us briefly describe, then, this method, pointing a moral at the same time.

During the spring months these birds, in great flocks, fly north over the countries mentioned; but they usually fly so high that the sportsman has little chance to get at them unless he can, by some artifice, lure them within easy reach. For effecting this he has recourse to the following device: A refuge is built of brush in an open field, usually one newly sown with grain. Outside this so-called "hough house," and distant from it some 200 yards, a large net is spread on the ground, one-half of it being so turned back on itself that it can be sprung by a rope reaching into the "hough house." The ground uncovered by the reversed portion of the net is then thickly strewn with wheat or other grain.

It might be thought that the pigeons passing over and seeing this grain would at once come down and feed upon it; but this rarely happens unless they be enticed to do so. Aware of this, the wily fowler makes ample preparation for such emergency. Two birds kept over from last year's catch are now brought into service, the one called the "stool pigeon" and the other the "flyer." The first of these is utilized by having its feet fastened to the outer end of a wooden bar working on a pivot, a cord from the other end of this bar reaching into the "hough house." To one leg of the "flyer," after its eyes have been sewed up with a fine thread, is attached a long piece of twine.

Things thus arranged, the man on the lookout with the "flyer" in his hand, conceals himself behind the boughs and there watches until he sees a flock of wild pigeons approaching. When near enough, he throws up the "flyer," which, speeding away until it has reached the end of the twine, is then hauled to the ground. Attracted by the movements of this bird, the flock, wavering at first in its flight, soon turns from its course and swooping down, alights on the well-bestrewn patch of grain, the "stool-pigeon" on its perch having by the vigorous jerking of the bar been made to flutter vehemently the while. The instant the deluded birds have got well settled, the net is sprung and as many as it will cover are entrapped in its meshes.

If it be asked, "Wherefore this cruel process of sewing up the eyes of the 'flyer'?" the answer is, without this, the bird, endowed with more sense and more tenderness than we of human kind, would, with its far-reaching glance, have warned these voyageurs through "the viewless air" of the impending danger. Hence this cruel obstruction of its vision.

Moral: The simple person who, beguiled by the "stool-pigeons" and "flyers" of the subtle speculator, invests his money in mining shares or other dangerous "security," shall in the end find himself, like the emigrating wild fowl, fatally ensnared in the net set to entrap him. Verily do both the cruel fowler and the crafty stock-sharp, each in his way, find the decoy of the utmost use in plying his cold-blooded vocation.

The Yosemite Annex.

We have alluded to the establishment of a new national park to be named "Sequoia" from the grand native trees, which it will protect from the inroads of timber-cutters. Perhaps all may not be aware that the United States Government has arranged for another national preserve in California, by a law setting apart 48 townships of land adjoining the Yosemite as a national park. The nominal area of the reservation is 967,000 acres, being 36 miles in the greatest extent north and south and 48 miles in east and west lines. But all this area is not included, because of a clause inserted later which reserves from the provisions of the Act all of the present Yosemite grant now owned and controlled by this State, and also all lands for which patents have been issued to bona fide settlers under the land laws. This leaves the Yosemite proper under its present control. The adjoining park in the vast area above mentioned will be under the direct control of the Secretary of the Interior.

The lands set apart for this vast park are townships 1 and 2 N., in ranges 19, 20, 21, 22, 23, and 24 E.; townships 1 and 2 S., in ranges 19, 20, 21, 22, 23, 24 and 25 E.; and townships 3 and 4 S, in ranges 19, 20, 21, 22, 23, 24, 25 and 26 E., M. D. M.

This park area includes the watershed for all the wonderful falls of the Yosemite, the picturesque Hetch Hetchy Valley and a valuable sugar-pine forest of about 80,000 acres, besides immense tracts of other timber.

Mining Laws vs. Directors' Duties.

The superintendent of the Con. Virginia and California mine answered the questions put by a stockholder at the last meeting of that company. The questions so asked were such that any stockholder is entitled to know, and had the officers in this city been alive to the duties of their position they should have been in position to give the desired information. In the answers returned by the superintendent it is acknowledged that mine assays are taken. This being the case, why are they not sent to the head office in this city for the inspection of stockholders? The latter are lawfully entitled to the information.

The MINING AND SCIENTIFIC PRESS has commented freely and without bias on the management of the Comstock mines. They are incorporated under the laws of California, and the position of trust assumed by their "trustees" makes them servants whose position and responsibility are clearly defined by said laws. In making contracts—no matter what the nature of the contract may be—they must not forget that they are acting in a fiduciary capacity for all stockholders of the corporation, and any violation of their trust must be amenable to the laws of this State governing corporations.

It is an anomaly, to say the least, for trustees or directors, when asked by stockholders at their public meetings regarding the production, separation and disposition of the bullion—bullion being the only product of the corporation—to be unable to answer the questions without referring them to another corporation of another State engaged in milling ores before a lucid answer could be made to such pertinent questions.

The MINING AND SCIENTIFIC PRESS does not wish to be too severe on trustees, but such answers are proof positive that the Comstock mines are represented, not by trustees for stockholders, but by "dummy-directors" held in their position by the hidden hand of the mill corporations incorporated under the laws of another State in order to avoid the responsibility of the California law holding them strictly accountable for any abuse of their trusteeship.

A conflict might arise between the laws of California and the laws of Nevada, upon the acts done by corporations of these respective States; but the PRESS cannot see how trustees in these mines incorporated under the laws of this State, can escape the penalty imposed upon them for abusing their position of trust. That the ores of a California mining corporation can be almost confiscated, without proper restitution, by a mill corporation of Nevada, and that the trustees of the mining corporation under the California laws cannot be punished for being in collusion with the mill corporation of Nevada, is a proposition we refuse to entertain for one moment. The MINING AND SCIENTIFIC PRESS holds that the trustees of California incorporated mines are jointly and severally responsible for every act not done in the interest of the stockholders of the corporation placed in their position of trust. The PRESS further holds that the laws are broad enough to cover all their delinquencies in this respect. Several Supreme Court decisions can be quoted upon the subject, among which stands out prominently "The Farmers and Mechanics' Bank of Los Angeles vs. Downey." This decision not only holds the trustees accountable for their illegal acts, but compels them to pay all the money obtained from an illegal contract into the corporation treasury, to be shared in by all stockholders.

A similar decision in the Hale & Norcross mining suit will probably put a stop to the mill contracts on the Comstock lode for many years to come.

The Lean Gold Ores of California and Australia.

Mr. Andrew McKenzie writes us to know if there is any large amount of $2-per-ton auriferous quartz in California that can be mined and milled at a profit, as stated in our issue of last week, adding that he has had much experience in quartz-mining in Australia, where it was supposed the business could be done cheaper than anywhere else.

In answer to the above inquiry we may say, not generally can the gold-bearing quartz of California be mined and milled with profit if it yield no more than $2 per ton. Still we have large quantities of quartz that form an exception to this general rule, this material occurring usually in the broad porphyritic belts that run with the mother lode. We have made inquiry of Mr. Irelan, State Mineralogist, as to the probable extent of these deposits, and are informed that they are of greater magnitude than has generally been supposed. Until recently very little has, in fact, been known about these porphyritic belts, few even of our best informed miners having looked upon them as appendages of the great central ore channel that traverses the country from Mariposa to Placer counties, a distance of nearly 70 miles.

During the past summer, Mr. Irelan, as Superintendent of the State Mining Bureau, has had the mother lode with all its accompaniments carefully examined from end to end; and it is probable that the report of the expert having charge of that work will prove a revelation as regards the leading features of this, the largest ore-bearing zone in the world. This report, to appear in the next volume issuing from the State Mining Bureau, will establish that there occurs on and in the vicinity of the California mother lode many million tons of $2 ore, the most of which exists under conditions that will admit of its being handled with profit.

Comparing the facilities that exist in California for utilizing low-grade ores with those found in Australia, the business stands something like this: Capital and labor are cheaper there than here; our machinery, as a whole, is better than theirs; we have also the advantage as regards wood and water for supplying motive-power, timber for making lumber, etc., the metallurgical process in use being in both countries much the same. Cheap transportation is another element in our favor, there being more railroads in California extending into or near the mining districts than in Australia, those districts being in that country situated farther from the seaboard and from navigable rivers than here. Everything considered, there is no doubt but we can handle a lower grade gold-bearing quartz than can be done by the people of the Antipodes or of any other large gold-producing country.

Important Sale.

Probably the most important mining transaction in Southern New Mexico during the present year is the recent sale of the Albamhra mine, in the Black Hawk district, 18 miles southwest of Silver City. This mine was the property of Miller & Dodd. H. L. Pickett, Esq., attorney of Silver City, negotiated the sale to some Chicago parties for $100,000, which was paid in cash. The purchasers have organized a stock company with sufficient capital to push the work with vigor, which they propose to do. There is no doubt but that this mine is well worth the price paid. The ore is high-grade silver with considerable amounts of native. In its present state it will pay a handsome dividend on the amount invested, and when more fully developed, the new owners will reap a rich harvest. At the same time, the sale is a fortunate one for the former owners, as well as for this district, for, with the ample capital of this new company, we may look for greater developments than could have otherwise occurred.

A SYNDICATE has been formed in Chicago to build air-ships. They have a capital of $20,000,000, and will have a ship built inside of 60 days that will be perfectly controllable, and that with it the trip round the world can be made in five days.

THE outfit of a hop-picker that started from Howell Prairie, Oregon, the other day, comprised two packages of cigarettes, a bottle of whisky, a pack of cards, a pistol, and a pair of blankets.

Salt-Making Processes.

NUMBER II

Steam or Grainer Methnde.

The grainer syatem is peculiarly American; for although the principle was not new when introdnced in Michigan, or even in the Kanawha region, yet its valne under the circnmstances which exist in both sections has caused great development and improvement. In the Kanawha and Ohio regions, weak brines had to be boiled down; in Michigan the lumber-mills furnished enormous qnantities of exhaust steam, so that a process by which salt is made by steam heat recommended itself at once, and there can be no question of the superiority of this method over all others when exhaust steam is available or where weak brines are to be boiled down. The issue between the advocates of pans and those of grainers can only properly refer to those cases when we have concentrated brines and no exhaust steam. Whether nnder snch circnmstances it is more economical to hnrn the fnel directly nnder the pan, or whether we get more real effect from combustion nnder a boiler nsing the steam as a

caps of the grainers are the draining-boards on which the salt is piled when lifted.

The grainer process has been introdnced into Germany, where grainers 150 by 18 feet and 2 feet deep are nsed, and the pipes are so arranged that they can be raised ont of the grainer when the salt is to be lifted. A grainer is lifted every five days and great saving over the pan methods is claimed.

In respect to results, the capacity of grainers is nsually reckoned by the nnmber of square feet of grainer snrface reqnired to produce a barrel of salt in 24 hours, which is got by dividing the total nnmber of square feet by the daily production in barrels. The Saginaw exhaust steam blocks average one barrel of salt to every 32 to 36 square feet of grainer and to every 2.5-horse power of boiler capacity.

Pacific Gas or Gasoline Engines.

Among the growing industries of this coast, no other, perhaps, has taken snch rapid strides dnring the past year as the mannfactnre of gas engines. Although these engines have been in nse in this vicinity bnt a very short time comparatively, they are now widely recognized for many purposes as the most convenient, economical and safest power.

A visit to the works of the Pacific Gas Engine Co. shows the demand for their popnlar engine to be far in excess of their ability to supply, forcing them to make arrangements which will within the next 60 days more than double their present ontput.

On the first page of this issue we illnstrate their single and double engines. The motive-power is obtained by drawing air over gasoline which is contained in an iron tank (or carbnretter) located at some distance from the engine. This is again mixed with pure air, which mixtnre of air and gas is drawn into the cylinder of the engine by the downward stroke of the piston, and there closely compressed by the upward stroke of the same. This mixture of air and gas in its compressed state is ignited by an electric spark produced by a small battery. This mixture of air and gas, upon being ignited, produces extraordinary power by the expansion of the heated gas. When the engine is operated by natnral or mannfactnred gas, direct commnnication is made to the meter.

These engines are now in practical use, snpplying power for pnmps, printing-presses, grape-cnrshers, cream-separators, electric-lighting, factories, etc. They are specially adapted for mining and irrigating in locations where fnel is scarce, and have in many cases displaced horse-powers, windmills and steam.

The Stockton Street Railway Co. has fitted np a car with these engines, and it is now in snccessful operation in that city. Their motor carries 40 passengers at a speed of ten miles per honr. The company plans to adopt this system on their entire line, and will probably have it in operation early in the coming year. San Jose is also advancing in this direction, and has a Pacific street-car motor now ready to be pnt on their tracks. Sacramento capitalists are taking a deep interest in the new power and are now taking steps toward introducing it in that city.

These motors are claimed to be nnder perfect control, start easily without nnpleasant jar, and run more smoothly than the dummies on our cable lines.

Another field in which this motor has been snccessfnlly applied is in the propelling of boats. A number of launches are now afloat in the bay and in the waters about Sacramento, Stockton, San Diego, Monterey, etc. The launch Viva, a 15-foot boat, fitted np with a three-qnarter-horse power engine, runs seven miles per honr

Four of these engines are now in the Mechanics' Institute Fair. A four-horse power is furnishing power for a 60-light electrical storage system, and a three-fourths horse power is running an ice machine. They also have pumping and heat engines on exhibition.

Regents of the University of California.

At a recent meeting of this body, the following proceedings were had, T. G. Phelps presiding.

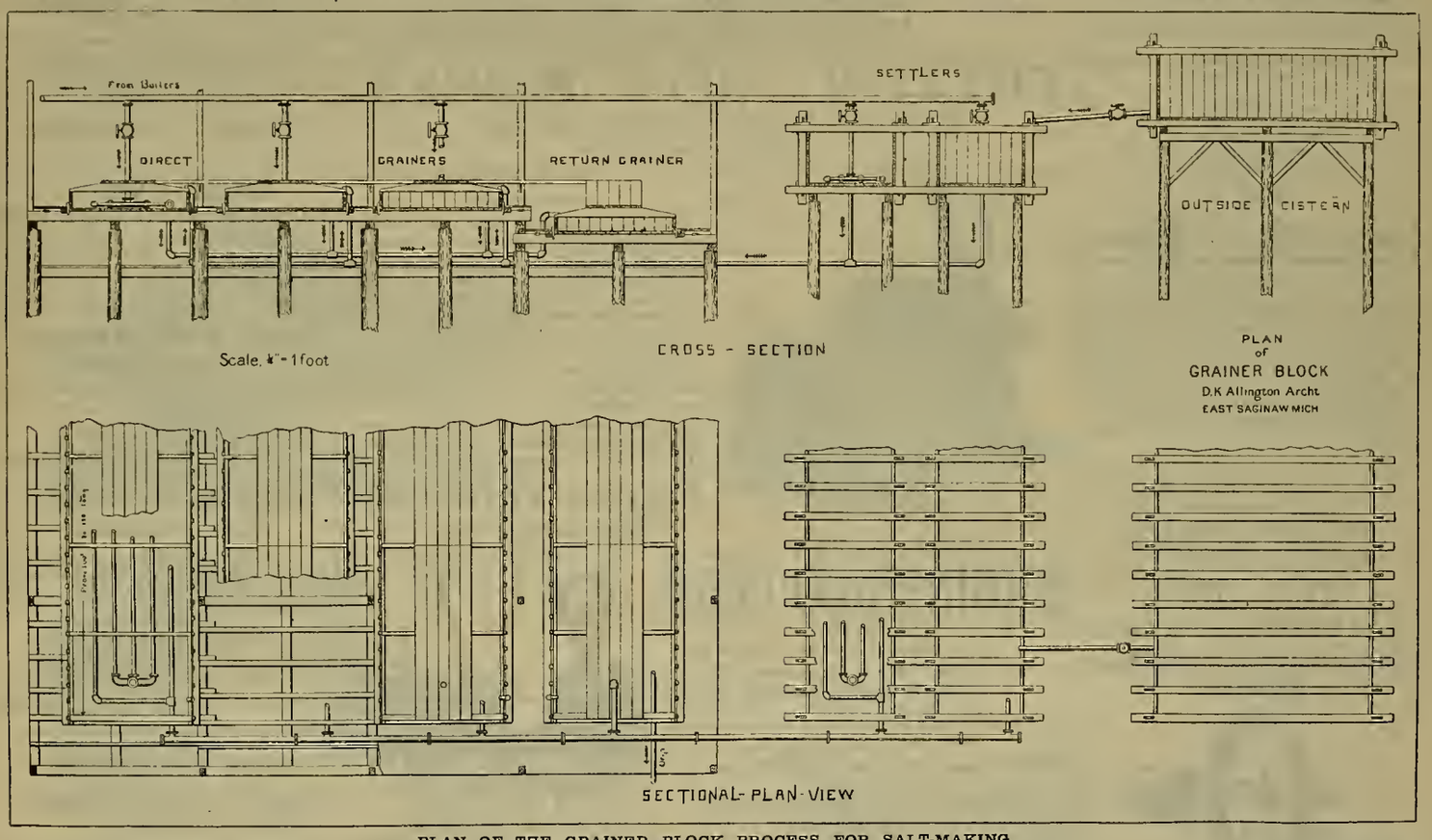
Andrew C. Lesson was elected Assistant Professor of Mineralogy at a salary of $2000 a year. He brought recommendations from the first professors of Europe.

The resignation of Adolph Sommer, Assistant Professor of Chemistry, was accepted, and F. W. Wright appointed to the position at a salary of $50 per month.

Prof. Kellogg, who is acting as President of the Academic Senate, was invited to attend the meeting of the Regents.

On motion of Regent Rodgers, a resolntion was adopted expressing regret at Prof. Jackson's resignation.

The Finance Committee reported that it had



PLAN OF THE GRAINER BLOCK PROCESS FOR SALT-MAKING.

heat conveyor, and thus evaporating the brine, is a much-vexed question. The advocates of either method adduce arguments apparently nnanswerable in support of their views; elaborate calculations can be worked ont, and each side is well supplied with instances of poor work by the other system. The grainer plant consists of the boilers and the grainers. As to boilers, various forms are nsed, all, however, high pressnre, the connections, pipes, etc., being designed for that system.

Fig. 2 gives a plan of a grainer system fnrnished by Mr. D. K. Allington of East Saginaw, Mich., and is a good example of the prevailing form of construction. The ontside cistern receives the brine from the well, and in it the brine is "limed." Two steam settlers bring the brine to saturation or as near to it as the needs of the grainers will allow, and from the steam settlers the brine is drawn into the direct grainers, where the salt is in great part made. The direct grainers are heated by coils of 3½-inch pipe, which hang in the brine a short distance above the bottom of the grainers, and through which passes the exhaust steam of the mill engine; a direct connection with the boilers allows the use of live steam when the engine is not running. The return grainer is heated by the exhaust of the direct grainers, and receives the brine drawn off from them. On the

not audited bills to the amount of $574 for work at the agricultural equipment station at Jackson, Amador county, because the board had not perfected its title to the land on account of $50 which had been paid to A. Caminetti to be given to an Italian who was willing to release all his claims for that amount. The money had not been paid to the Italian, although given for that purpose almost two years ago.

Regent Wallace believed that the bills should be audited anyhow, as the board owed the money for services rendered.

Regent Green suggested that Caminetti be sued for the money, as he is now running for Congress and would promptly pay. Caminetti is the patron of the University at the Jackson Station.

Regent Houghton reported that he had been solemnly promised that the money would be paid in a few days, and the bills were ordered paid.

TRIPLE EXPANSION ENGINES.—We are in receipt of a work on this class of machines by Prof. Osborne Reynolds. The expansion of steam in three or more cylinders being now a subject that much occupies the attention of engineers and manufacturers, they will find the above work a great assistance to them in their inquiries and experiments. The book is published by the Van Nostrand Company, 23 Murray St., New York, constituting No. 99 of their Science Series.

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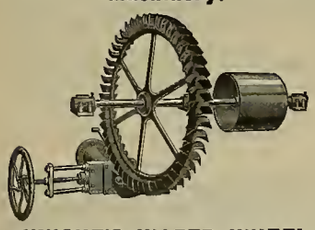

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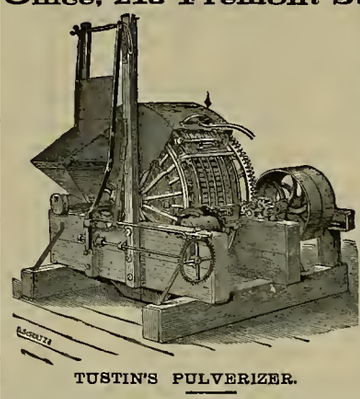

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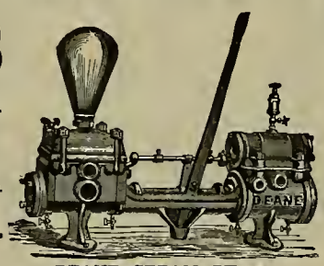

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SPECIALTIES:
Corliss Engines and Tustin Ore Pulverizers.
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THE GIANT POWDER COMPANY
Manufacture Three Kinds of Powder, which are acknowledged by all the Great Chemists of the World as

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Of Different Strengths as Required.

NOBEL'S EXPLOSIVE GELATINE," which contains **94 per cent of Nitro-Glycerine,** and **GELATINE-DYNAMITE, Stronger than Dynamite** and even Safer in Handling.

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FOR RAILROADS AND LAND CLEARING. Is from three to four times stronger than ordinary Blasting Powder, and is used by all the Railroads and Gravel Claims, as it breaks more ground, pulverizes better and saves time and money. It is as dry as the ordinary Blasting Powder and runs as freely.

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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.
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MINING ENGINEER.
LATE ASSISTANT GEOLOGIST U. S. GEOLOGICAL Survey. General Manager La Velera (Limitada), via Torres and La Barranca, Sonora, Mexico.

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Civil and Mining Engineer,
MINING EXPERT AND GEOLOGIST.
Address "Business Box A," office of this paper, San Francisco.

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Mining and Hydraulic Engineer,
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Of all kinds made to order. Send for Descriptive Catalogue. **17 and 19 Fremont St., San Francisco**

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Beats them all. Works dry ores. Makes even granulation. No dead work, hence minimum wear.
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The very best. Uses no water. No freezing up. Saves hauling waste. Saves high percentage. Send for circulars.
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Hoisting Engines, Safety Cages, Safety Hooks,

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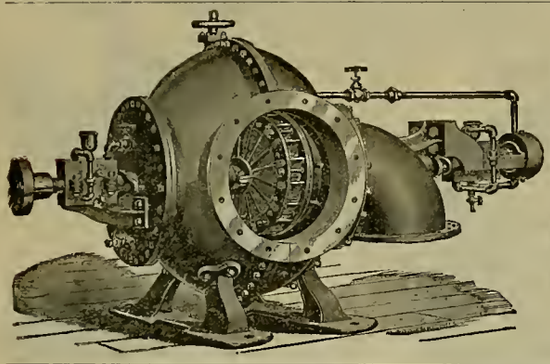
HELENA, MONTANA, Room 28, Merchants' National Bank Building, No. North Main St.

SOLE WESTERN AGENTS FOR TYLER WIRE WORKS DOUBLE CRIMPED MINING CLOTHS.



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Mining Turbine Water Wheel.

These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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FRASER & CHALMERS, General Agents, Chicago, Ill., and Denver, Col.

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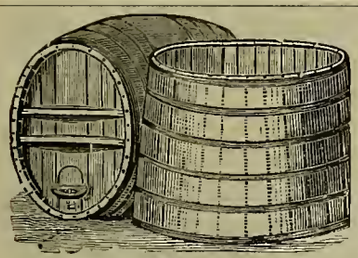

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SHIP, MINING, and WATER TANKS a Specialty.

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T. C. HOCKING, Editor.

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For information concerning this process for the reduction of Ores containing precious metals, and terms of license, apply to

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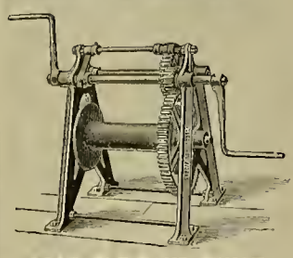

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SINGLE, ENDLESS TRAVELING ROPE.

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No Possibility of Load Slipping. Cheapest Form of Transportation.

No road needed; can be run vertically. No power needed if angle of descent be more than 8 degrees.

CAN SPAN GULCHES 2000 FEET WIDE.

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Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

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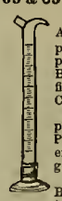

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Ores worked by any Process.
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Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
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BATTERY SCREENS.

Best and Cheapest in America.

No imitation, no deception, no planished or rotten iron used. Only genuine Russia iron in Quartz Screens. Planished iron screens at nearly half my former rates.

I have a large supply of Battery Screens on hand suitable for the Huntington and all Stamp Mills, which I will sell at 20 per cent discount.

PERFORATED SHEET METAL

For Flour and Rice Mills, Grain Separators, Revolving and Shot Screens, Stamp Batteries and all kinds of Mining and Milling Machinery. Iron, Steel, Copper, Brass, Zinc and other metals punched for all uses.

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Extra sizes and lengths made to order on short notice.

611 & 613 Front St., San Francisco, Cal.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 23, 1890.

General trade has been quite active, more goods going out than at any time this year. Merchants and manufacturers in general are quite cheerful and express confidence in the future.

The local money market is close. Funds are being drawn from the East. The call, while said to be general, is chiefly for wheat advances.

The steamer Belgic took out the following treasure to China and Japan: Mexican dollars, 152,704; gold coin, $34,695; gold dust, $940. Total, $188,339.

MEXICAN DOLLARS—Trade continues quiet. The drop in silver causes remitters to China to take exchange instead of coin. Mexican dollars are quiet at 85¼@86c.

SILVER—Press telegrams report the following from Washington, Oct 20: The amount of silver offered to the Treasury to-day was 1,217,000 ounces. The amount purchased was 647,000 ounces, as follows: 27,000 ounces at $1.0940, 50,000 at $1.0948, 50,000 at $1.0959, 70,000 at $1.0966, 50,000 at $1.0964, 200,000 at $1,0977. Oct. 22: The offerings of silver to the Treasury to-day amounted to 1,274,000 ounces. The amount purchased was 515,000 ounces, as follows: 15,000 ounces at $1.0925; 100,000 at $1.0939, 100,000 at $1.0940, 100,000 at $1.0943, and 200,000 at $1.0944. In the local market there is very little doing. Quotations are nominal at about $1.09. There is a more general disposition to hold silver for better prices, but in the meantime the price continues to shade off. The falling off in the price strengthens the position of himetallists and will force free coinage to the front as the only safeguard against speculators.

QUICKSILVER—Receipts the past week aggregate 271 flasks. The market is steady with a fairly good demand reported. Outside of the above receipts a consignment of 250 flasks came in from Liverpool. There was shipped by overland mail to the East in last month, 20,250 lbs.

BORAX—Receipts the past week aggregate 621 centals. The market is strong with a good demand from the East. In last month the overland shipments aggregated 597,790 lbs.

LIME—Receipts the past week aggregate 5070 hhls. The demand has been more active, owing to continued dry weather.

TIN—The market is weaker for pig, although the pool asks full prices. Tin plate is strong. Active buying in London is reported for this market.

IRON—Imports the past week aggregate 48 tons from Liverpool. Our market is reported fairly firm. Eastern advices report some shading in prices.

LEAD—The market is steady. Eastern advices report a strong tone to the market, although higher prices are not looked for in the immediate future.

COPPER—The market is quiet but firm. There was sent the past week 1570 lbs. of copper to Mexico. Overland shipments in last month aggregated 24,030 copper cement. Eastern and foreign market advices are confirmatory of a strong tone with the surplus going quite rapidly into consumption.

COAL—Imports the past week aggregate as follows: Newcastle, N. S. W., 7980 tons; Port Townsend, 1419; Tacoma, 4000; Departure bay, 2250; Seattle, 1645; Nanaimo, 3400; Baltimore, 2600. Total, 23,294 tons. An advance has been made all around for spot. Quotations are subject to change without notice. Dealers look for still higher prices. The Australian strike has not been settled. Wellington coal comes in sparingly. When a cargo does come in, it takes several hours before a team can get a load. Coast coal is not coming in freely. The scarcity of cars prevents receipts of Colorado and Wyoming coals. The Railroad Company say that in about 30 days they will have plenty of cars, when coals from the above States will begin to set freely this way.

San Francisco Metal Market.

WHOLESALE.

	THURSDAY, October 23, 1890.	
ANTIMONY	— @	21½
BORAX—Refined, in carload lots	8 @	—
Powdered " " "	8 @	—
Concentrated " " "	7½@	—
All gradee jobbing at an advance.		
COPPER—		
Bolt	23 @	25
Sheathing	23 @	25
Ingot, jobbing	20 @	—
do, wholesale	18 @	18½
Fire Box Sheets	23 @	26
LEAD—Pig	6 @	6½
Bar	6½@	6¾
Sheet	7¼@	—
Pipe	7 @	—
Shot, discount 10% on 600 bags Drop, ₩ bag.	1 90 @	—
Buck, ₩ bag	2 10 @	—
Ohilled, do	2 30 @	—
QUICKSILVER—By the flask	56 00 @	56 50
Flasks, new	— @	—
Flasks, old	45 @	55
CHROME IRON ORE, ₩ ton	10 00 @	—
STEEL—English, lb	16 @	20
Canton tool	9 @	9
Black Diamond tool	9 @	9
Pick and Hammer	8 @	10
Machinery	4 @	5
Toe Calk	4½@	—

	Spot.	To Load.
IRON—Glengarnock ton	34 00 @ —	30 @ —
Eglinton, too	34 00 @ —	30 @ —
American Soft, No. 1, ton	— @32 00	30 @ —
Oregon Pig ton	— @33 00	— @ —
Puget Sound	34 00 @ —	— @ —
Bar Iron (base price) ₩ lb	— @	— @ —
Clay Lane White	— @28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Langloan	34 00 @ —	30 @ —
Thorncliffe	34 00 @ —	30 @ —
Gartsherrie	34 00 @ —	30 @ —
Barrow	34 00 @ —	30 @ —
Thomas	33 00 @ —	— @ —
Cargoflect	30 00 @ —	26 @ —

Coal.

SPOT FROM YARD—PER TON.		TO LOAD—PER TON.	
Wellington, nominal	$10 50	Australian	$ 9 00@—
Greta	14 00	Liverpool S't'm.	8 50@—
Carbon Hill	0 00	Scotch Splint	8 50@ 9 00
Nanaimo	11 00	Cardiff	8 50@—
Gilman	11 00	Lehigh Lump	16 60@17 00
Seattle	11 00	Cumberland bk	13 60@—
Coos Bay	11 00	Egg, hard	16 00@—
Cannel	16 00		
Egg, hard	16 00	**Coke—English.**	
Cumberland, in sacks	10 50		
do, bulk	18 00	To load	$12 00@13 00
Wallsend	13 00@14 00	Spot, in bulk	16 00@18 00

All spot quotations subject to change without notice.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alpha Cons M Co	Nevada	5	25	Sept 16	Oct 22	Nov 11	O E Elliott, 309 Montgomery St
Alta M Co	Nevada	39	50	Sept 1	Oct 7	Oct 29	L Osborn, 309 Montgomery St
Baker Divide & M Co	California	18	20		Nov 17	Dec 8	D M Kent, 330 Pine St
Challenge Con M Co	Nevada	7	50	Sept 26	Oct 23	Nov 17	O L McCoy, 331 Pine St
Goleta M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
Gray Eagle M Co	California	20	5	Oct 20	Nov 24	Dec 15	J M Buffington, 303 California St
Gould & Curry S M Co	Nevada	65	30	Sept 16	Oct 21	Nov 13	A K Durbrow, 309 Montgomery St
Hale & Norcross M Co	Nevada	96	50	Oct 7	Nov 12	Dec 3	A B Thompson, 309 Montgomery St
Humboldt M & M Co	Nevada	1	1	Aug 16	Sept 29	Oct 25	J O Ruddock, 35 New Montgomery St
Leigh Gravel M Co	California	1	25	Sept 3	Oct 13	Nov 5	E E Fall, 320 Pine St
Live Oak Drift Gravel M Co	California	12	5	Sept 3	Oct 9	Oct 31	J Morizio, 328 Montgomery St
Mono G M Co	California	30	25	Sept 18	Oct 28	Dec 2	B L Burling, 309 Montgomery St
Montecito M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
North Peer G & S M Co	Arizona	6	5	Oct 1	Nov 5	Nov 25	Henry Deas, 309 Montgomery St
Russell Reduction and M Co	California	7	5		Nov 17	Dec 8	J Morizio, 328 Montgomery St
Sterling M Co	California	1	6	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
Seg Belcher & Mides Cons Co	Nevada	7	25	Oct 7	Nov 10	Dec 1	E H Holmes, 309 Montgomery St
Silver King M Co	Arizona	4	30	Sept 20	Oct 28	Nov 18	Aug. Waterman, 325 Montgomery St
Weldon M Co	Arizona	3	10	Sept 3	Oct 9	Oct 30	A Waterman, 309 Montgomery St

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Caledonia M C	Nevada	A S Cheminant	328 Montgomery St	08	July 15
Con California & Va M Co	Nevada	A W Havens	309 Montgomery St	25	April 10
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Idaho M Co	California	Grass Valley	2 50	Mar 7	
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Oct 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 2.		WEEK ENDING Oct. 9.		WEEK ENDING Oct. 16.		WEEK ENDING Oct. 23.	
Alpha	1.65	1.80	1.50	1.75	1.55	1.80	1.60	1.75
Alta	1.05	1.20	1.05	1.20	1.05	1.35	1.15	1.45
Andes	2.25	2.8	2.25	2.55	2.30	2.80	2.05	2.35
Belcher	3.25	3.40	3.15	3.40	3.25	3.35	3.05	3.10
Best & Belcher	3.75	3.95	3.60	3.85	3.60	3.85	3.30	3.40
Bullion	2.80	2.95	2.75	3.70	3.40	3.75	3 10	3.55
Bodie Con	1.40	1.75	1.45	1.65	1.70	1.95	1.80	3.00
Bulwer	.30	....	.25	....	.25	.35	.35	.55
Commonwealth	2.50	....	2.75	....	....	....	2.00	....
Con. Va. & Cal	4.75	4.90	4.75	4.90	4.75	4.85	4.15	4.70
Challenge	2.55	3.10	2.50	2.90	2.65	2.75	2.60	2.80
Chollar	3.20	3.40	3.15	3.75	3.45	3.75	3 15	3.50
Confidence	7.00	8.00	7.00	7.75	7.50	....	7.00	....
Con. Imperial	.40	.45	.40	.45	.45	.55	.35	....
Caledonia	.55	.60	.55	.60	.55	.60	.45	.50
Crown Point	2.75	3.00	2.70	2.90	2.80	3.00	2.75	2.95
Crocker	.25	....	.30	....	.30	....	.25	.30
Del Monte	....	....	.80	....	.75	....	....	....
Eureka Con	4.25	....	4.25	4.20	4.25	4.00	....	....
Exchequer	1.20	1.30	1.15	1.50	1.40	1.80	1.25	1.40
Grand Prize	.40	....	....	....	.40	....	.30	....
Gould & Curry	2.25	2.30	2.20	....	2.20	2.30	2 05	2.35
Hale & Norcross	2.35	2.45	2.20	2.40	2.10	2.25	2.00	2.15
Julia	.35	....	.30	.35	.30	.35	.30	....
Justice	1.50	1.60	1.40	1.65	1.55	....	1.35	1.45
Kentuck	1.65	1.80	1.60	1.85	1.80	2.35	1.95	2.20
Lady Wash	.60	....	.60	....	.60	.65	.45	.50
Mono	.55	.60	.65	....	.60	.75	.65	1.55
Mexican	3.35	3.60	3.40	3.50	3.30	3.40	3 00	3.20
Navajo	....	....	.30	....	.35	....	.35	.40
North Belle Isle	1.10	....	1.00	1.05	1.05	1.45	1.35	1.45
Nev. Queen	.90	....	.75	....	.90	....	.76	....
Occidental	2.00	2.30	1.95	2.15	1.90	2.00	1.70	1.95
Ophir	5.00	5.25	5.00	5.25	5.00	5.37	4.70	5.00
Overman	2.15	2.30	2.25	2.45	2.35	2.45	2.15	2.35
Potosi	6.62½	7.00	6.75	7.62	7.25	7.75	6.12	7.25
Peerless	.30	....	.25	....	.25	.30	.25	.30
Peer	.20	....	.20	.25	.25	.30	.25	.30
Savage	3.70	3 90	3.65	3.75	3.40	3.70	3.00	3.30
S. B. & M	1.50	1.70	1.50	1.60	1.45	1.60	1.25	1.50
Sierra Nevada	2.90	3.25	2.90	3.10	3.10	3.45	3.00	3.20
Silver Hill	.35	.40	.30	.35	.25	.30	.25	....
Scorpion	.30	....	.25	....	.30	....	.25	....
Union Con	2.90	3.05	2.85	3.05	2.90	3.30	2.90	3.10
Utah	1.10	1.25	1.10	1.20	1.15	1.35	1.15	1.25
Yellow Jacket	3.35	3.50	3.35	3.50	3.35	3.50	3.20	3.35

* Assessment delinquent.

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 23, 9:30 A.M.

250	Hale & Nor	2.05	@2.10
200	Kentuck		2.15
100	Lady Washington		50c
100	Mt Diablo		2.25
650	North Belle Isle		1.40
150	Ophir		4.90
100	Overman		2.30
100	Potosi	6.37½	@ 50
150	Savage		3.15
100	Scorpion		30c
100	Seg. Belcher		1.40
370	Sierra Nevada	3.35	@3.40
600	Silver King		45c
100	Union Con		3.15
600	Utah	1.25	@1.30
200	West Consolcd		50c
100	Yellow Jacket		3.30
850	Alpha Coo		1.90
400	Alta		1.50
250	Andes		2.10
100	Belcher		3 10
150	Best & Belcher		3.65
300	Bodie		2.65
250	Bullion		3.35
300	Caledonia		50c
400	Central	20	@25c
50	Challenge Con		2.40
200	Chollar		3.25
370	Con. Cal. & Va	4.70	@4 75
50	Crown Point		2.85
400	Eureka Con		3.50
200	Exchequer	1.35	@1.40
150	Gould & Curry		2.45

Eastern Metal Markets.

By Telegraph.

NEW YORK, October 22.—The following are the closing prices the past week:

	Silver In London.	Silver in New York.	Copper.	Lead.	Tin.
Thureday	49¾	1 00	$16 75	$5 80	$21 75
Friday	49¾	1 09¾	16 75	5 75	21 60
Saturday	49¾	1 09¾	16 75	5 75	21 50
Monday	49¾	1 09	16 76	5 90	21 25
Tuesday	49¾	1 08¾	16 75	6 90	21 35
Wednesday	49¾	1 09	16 76	6 90	21 35

NEW YORK, October 20.—Quicksilver was steady at 70@82c. Borax was scarce and firm at 9¼@9¾c for California refined. Pig Lead was weak with free offerings of foreign. The easy prices took the backbone out of domestic, which is now quoted dull at 6¾c; round lots of near future, 5¾c. Copper is steady. All large producing mines are well sold up. Tin is feverish.

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Assessment Notices.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 20th day of October, 1890, an assessment (No. 20) of Six Cents (6c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 11, No. 303 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 15th day of December, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office—Room 11, No. 303 California Street, San Francisco, California.

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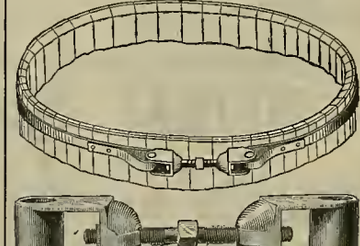

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C. S. HALEY, Secretary.

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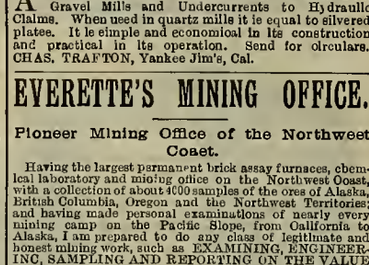
Patented June 17, 1890.



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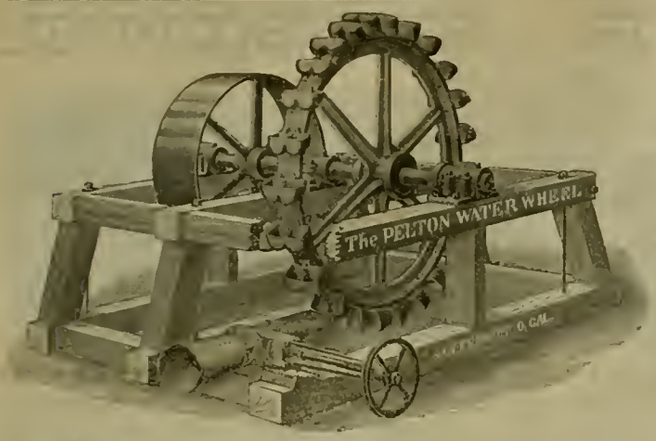

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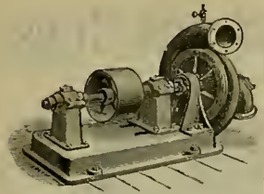

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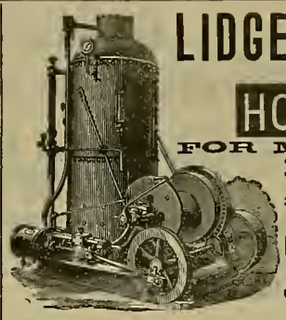

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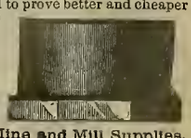

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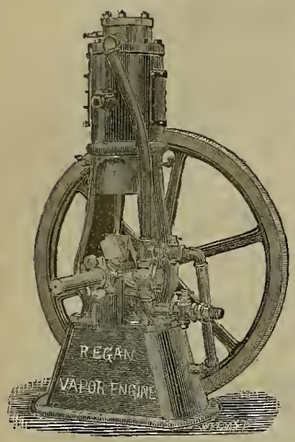

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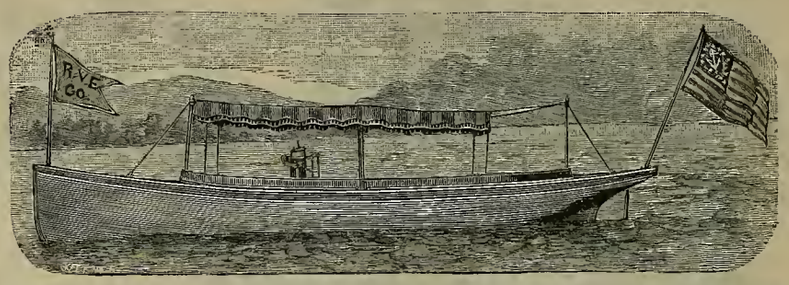

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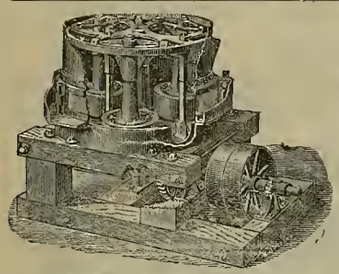

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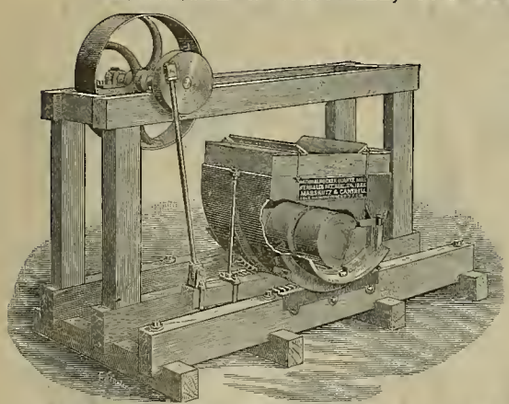

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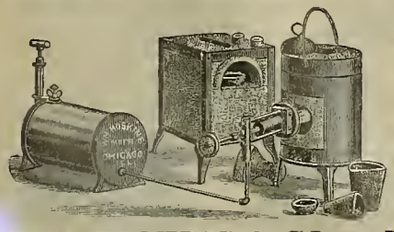

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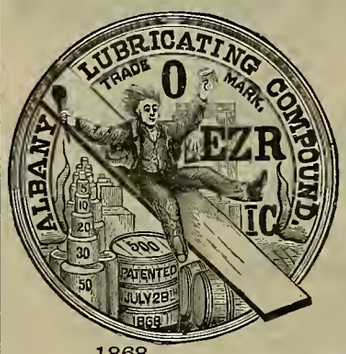

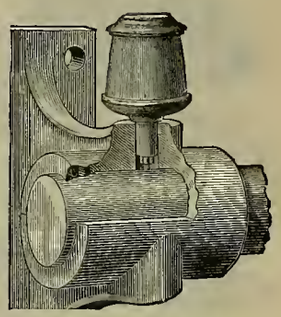

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Manufacture commenced a Albany, New York.

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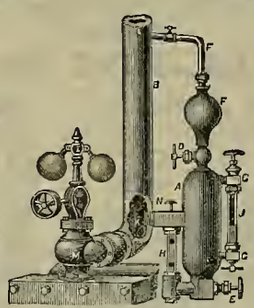

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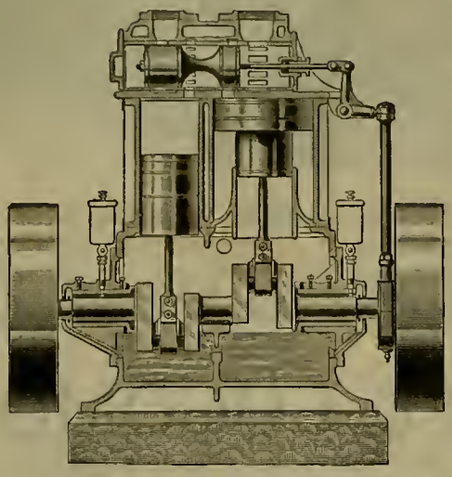

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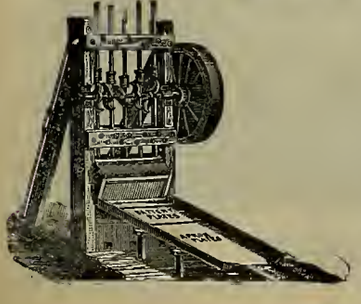

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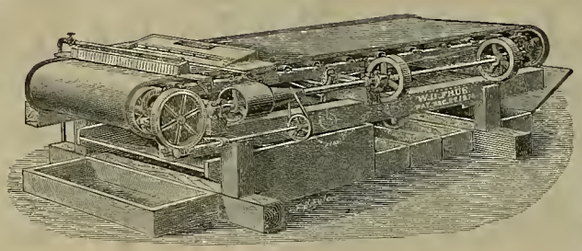

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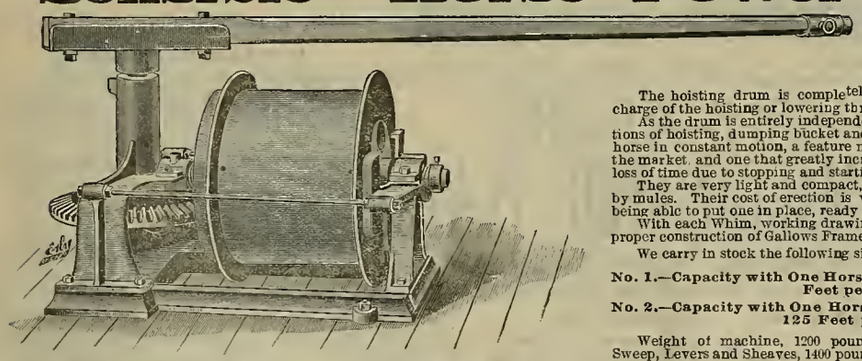

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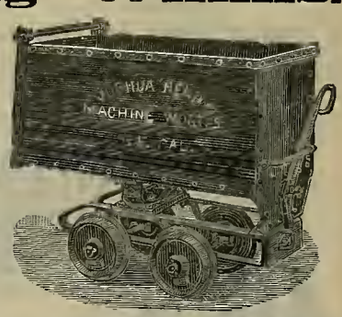

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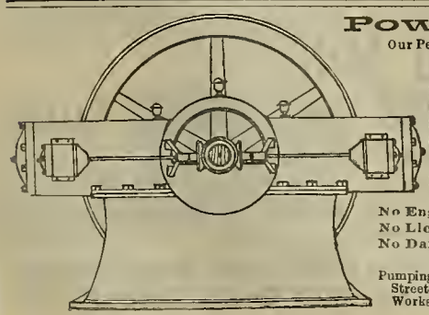

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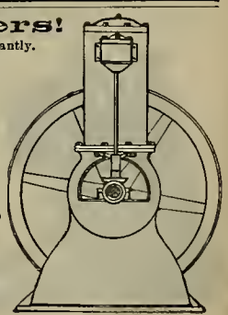

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An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 18.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, NOVEMBER 1, 1890.

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Concentrating Low-Grade Ores.

Henry F. Armitage of Lake City, Colo., in a paper before the American Institute of Mining Engineers, describes a spitz-lutte and gives a sketch as follows:

It consists of two inverted cones, one inside of the other. The inner cone is suspended from a frame by a threaded bolt fastened to a cross-brace, *aa'*, on the cone. The outer cone rests on the dead water tank, *cc'*. The ore and slimes after passing through the 18-mesh revolving screen, run into the inner cone and pass out through the perforations, *B*, at the bottom, into the space between the two cones. Here they encounter an up-current of water coming from the pipe *bb'*. This pipe is connected with a tank at sufficient hight to give the required head. The finer slimes are separated and washed out at the point *cc'* where they run into the trough, *EE'*, surrounding the outer cone and are carried to the buddle-table by the spout, *F*. The heavier particles of mineral and quartz fall into the hopper, *A*, and are drawn off by the stop-cock, *G*, on to the jig. By raising or lowering the inner cone, by the screw and nut, *ee'*, the space at the point of discharge can be increased or decreased. It is essential that this space should be of the same area as the area of the space at the point *H*, so that the up-flow of water will be of uniform velocity from the starting point at *H* to the discharge at *cc'*. This flow is regulated by the valve, *K*, and by it the quantity of slimes sent to the buddle-table can be controlled. The stop-cock, *G*, is kept open only sufficiently to let the ore that falls into the hopper, *A*, run off to the jig.

Fig. 2.

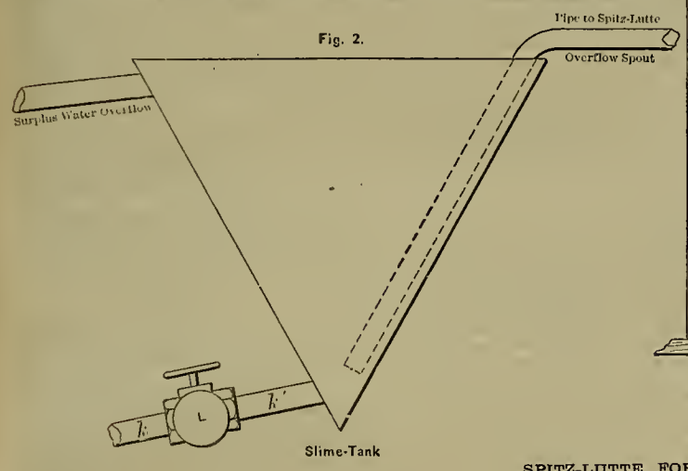
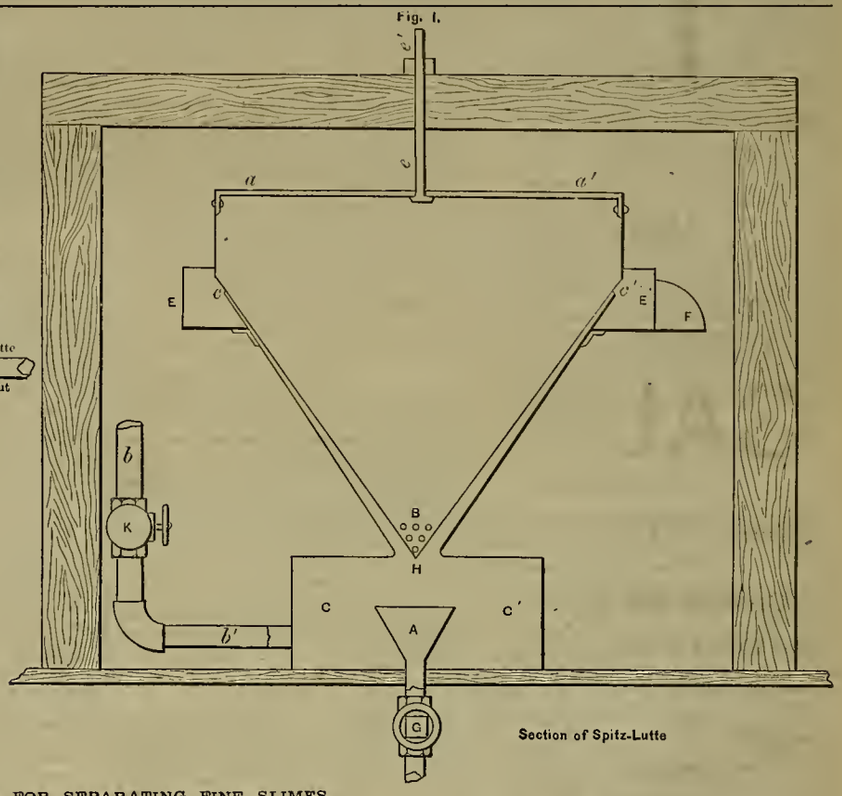
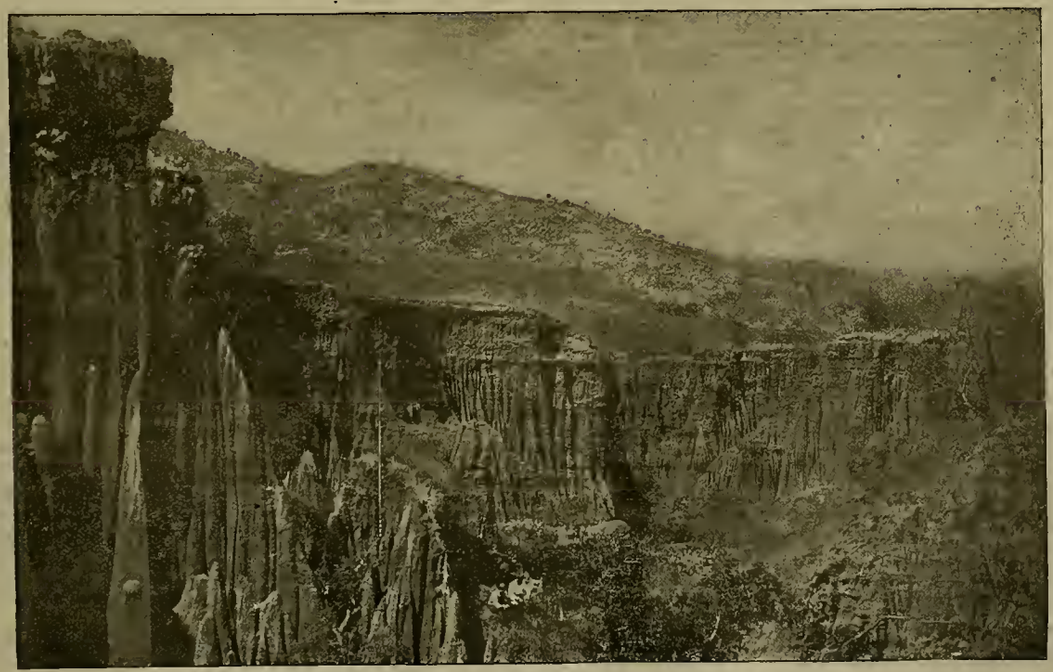


Fig. 1.



SPITZ-LUTTE FOR SEPARATING FINE SLIMES.



DECOMPOSED GRANITE IN THE TRANSVAAL GOLD-FIELDS.

This machine will take off all the slimes and let the ore of proper size go to the 18-mesh jig, the quantity being about 20 per cent of the ore crushed. As this ore, being very fine, takes longer to settle and pass through the jig-screen than the coarser sizes, I find it better to increase the number of compartments on this jig. This refers to ores that contain galena, gray copper, yellow copper, and iron pyrites, and from which it is necessary to save and separate these minerals.

The Linkenbach buddle was fully described in a paper by Mr. Richard P. Rothwell, read at the Boston meeting, February, 1883 (*Trans.*, xi., 475). It is a stationary table with rotating water sprays, which is considered an excellent apparatus for treating low-grade slimes, but, like the jigs, it must receive fair treatment to be able to do its work well. The slimes as they come from the spitz-lutte carry too much water. The whole of the water used on the revolving screens, together with that used in the spitz-lutte for washing out the slimes, would run on the buddle and prevent it from doing its work as it should. To prevent this excess of water from reaching the buddle, I let the slimes run into a hopper-shaped tank and draw them off from this to the buddle. By making the slimes from the spitz-lutte discharge at the bottom of the tank, as shown in the accompanying sketch, very little can rise to the surface of the tank, and get away by the overflow, the slimes being sucked out by the pipe *kk'* as fast as they are delivered. The valve *L* must be left open sufficiently to allow the slimes to pass to the buddle without accumulating in the tank, the surplus water passing off at the overflow.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Hydraulic Washing.

EDITORS PRESS:—In connection with my official work as United States Geologist, I have had frequent occasion to inspect the gold-bearing gravel deposits of this county and have been struck with the injustice done the mining community in not allowing these deposits to be worked by the hydraulic method. Except some valleys of limited extent, there is here no agricultural land that could be injured by the mining detritus for a distance of from 60 to 75 miles following the windings of the several forks of Feather river, and it is safe to say that only an infinitesimal amount of this material could get that far.

Moreover, the gravel deposits that lie at a considerable elevation, as in this county, are largely devoid of pipeclay and other fine sediment that could be transported far. In some cases trees are beginning to grow on the tailings, and this would unquestionably, in the course of time, effectually prevent further transportation of material either fine or coarse.

While fully recognizing the harm that has been done certain lands and the Sacramento river by the hydraulic washings in the foothills of the Sierra Nevada, I see no possible harm either to agriculture or to the navigation of the Sacramento and San Joaquin rivers that can come from mining by the hydraulic method in the higher parts of the Sierra Nevada.

It may not be generally known that the cultivation of the soil in valleys increases the amount of material washed away by rain water very markedly. The river Po in Italy is said to be now 70 feet above the valley in which it flows, the levees having been gradually built up to that hight as is now being done with the Sacramento levees.

This has been caused solely by the wear and tear of the natural forces, aided greatly by the stirring of the soil by plowing.

It is to be hoped that the time is not far distant when more discrimination will be observed in placing injunctions on hydraulic mines.

H. W. TURNER,
U. S. Geological Survey, San Francisco.
Plumas Co., Oct. 9, 1890

From the North Counties.

EDITORS PRESS:—Having during the past few months traveled extensively over this section of Northern California, affording ample opportunity to see much of the mines, I send you a few items relating thereto gathered during my journey.

Traveling down the Klamath river for more than a hundred miles, I found this had been a poor year for the hydraulic miners along that stream, owing to the great amount of damage done their works by the floods of last winter. Commencing at Richardson's Del Monte claim, two miles above Happy Camp, operations were here greatly retarded, owing to the destruction of a large portion of his capacious and costly ditch, much injury having been sustained by his sawmill and other property. This is one of the best properties on the river, but will turn out this year hardly more than one-half its usual complement of gold-dust.

Passing over a stretch of 40 miles along which much minor damage has been done, we arrive at the Heald mine, where again ditches and other portions of the plant have been much injured or wholly swept away. Skipping another considerable section of the river along which more or less harm has been caused by the high water, we come to the well-outfitted property of the English Company, above Orleans Bar, where large sections of costly ditch have been washed out, the sluice-boxes, undercurrents and other apparatus having been about all carried down stream. So complete has been the destruction here that the company has not as yet attempted to repair damages, nor is it quite certain when they will do so, though no doubt very soon, as this is a large and in all respects a first-class mining estate.

Below Orleans Bar, down to the mouth of the river, there is less hydraulic mining being done, nor is the plant here so much exposed to be injured by high water in the river or torrential floods descending from the mountains, these being the agencies most destructive to the ditches, built usually along the mountain-side and at a considerable elevation above the river. With the exception mentioned, most of the damage done by the heavy rains of last winter has now been repaired, and the hydraulic miners along the Klamath having now their claims in good shape, await the advent of the wet season to commence gravel-washing once more, the prospect for the coming season being unusually good.

As regards river-bed mining, of which a great deal is done along the Scott, Klamath and Salmon rivers, this season, owing to the postponement of the fall rains, is likely to prove an exceptionally good one, this class of miners having already, in many instances, gathered a rich harvest of gold.

Quartz mining throughout this whole northern section of California is also in a prosperous condition, many new claims having been opened and many new mills put up during the past year. As much of the ore here is of a friable character, the Huntington mill has come into large use in this portion of the State. As there occur, however, in all ledges hard knuckles and streaks of ore, this material when present, as it always is to a greater or less extent, causes some trouble in the Huntington mill, as the springing rollers, when they come in contact with this hard substance, fly back, and as some time passes before they return to the grinding surface, a great deal of their force is lost. Owing to the above defect, this otherwise excellent mill has in several cases that have come to my knowledge been thrown out. There is said to have been some sort of a spring attachment invented which remedies this defect in the Huntington mill, the same, as I am told, having been patented through the agency of Dewey & Co. I have seen none of these appliances in use here. Could you give me some information about them, where they have been introduced, their cost, how they operate, etc.? As the PRESS circulates widely—we see in fact no other mining journal in this region—it might interest your readers generally, more especially the quartz millers, to know something about the above device.

While the Old Diggings and the French Gulch districts in Shasta, Deadwood, New River and East Fork in Trinity, and Humbug, Oro Fino and Salmon river in Siskiyou, constitute the more active quartz mining centers in these several counties, there are many other localities in each of them in which this industry is being well prospered.

You remarked in the PRESS, a week or two since, on the dearth of mining items, owing to the much interest being paid in the mountain districts to politics. Even so, for never did the miners, as a class, manifest greater interest in matters political than now. But for all this they are not strongly partisan. For this reason the Senatorial candidate in this district, R. H. Campbell, a long resident and an old-time miner, gets a strong support without much regard to party platforms or predilections.

THOMAS L BAILEY.
Scott River, Siskiyou Co., Cal., Oct. 22, '90.

Silver King, Pinal County, Arizona.

EDITORS PRESS:—In saying, as I did in my last letter to the PRESS, that nothing was going on here in the way of mining outside of the Silver King, of course I had reference to mining companies owning mining property here, not to work being done by prospectors and practical miners engaged out in the mountains, studying their rocky tablets, sizing up their metallic wealth, and sinking prospect-holes on different seams of ore to ascertain the best one and the best place in which to do their work, and thus induce the capitalist to assist them to follow into the mountains and open up the secret treasure vaults, and thereby improve the financial condition of himself, the investor and mankind generally.

The Silver King Co. is still sinking the Bilk shaft, which has attained a depth of about 1175 feet.

Since writing you last, the Silver King Co. has discovered ore. This find is made in a drift some 500 feet northeasterly from the Bilk shaft. This drift is in the 985-foot level, generally termed the 1000 foot level. This drift they have been quietly driving since last April. The Bilk dump is assuming the "old" King dump's ancient hue. But this King kindly colored metalliferous rock does not come from the bottom of the Bilk shaft; it comes from the above-mentioned drift, which, possibly, is approaching the western verge of the ore channel that produced this chimney of *virgin silver* called the Silver King mine.

Mr. John Phillips, superintendent of the Mineral King, has returned from San Francisco, where he went to purchase machinery for the Crispin mine. He also purchased a ten-ton smelter which will arrive in eight or ten days. He has quite a force of men working, preparing the ground on which to plant the smelter. When he is ready to blow in he will commence reducing the camp to bullion. The Silver Crown Co., which is also a San Francisco corporation, is doing the annual assessment on its Lauretta, formerly the Athens mine, which in the early history of this camp was famed for the metallic silver it produced. Several prospectors are blooming the mountains now, doing assessment work. There are several prospects here which are promising enough, if developed, to become Silver Kings. Of their merits I shall in the future write.

CORRESPONDENT.

NICKEL ORE.—The chief of the Ordnance Bureau of the Navy Department is giving attention to the procurement of nickel ore or matte, for which Congress appropriated $1,000,000. A representative of the firms which deal in this ore and metal has been in communication with the department, and to ascertain the exact capacity of our domestic nickel works, several competent steel experts have been sent by the department to various parts of the country. Chief Folger of the Ordnance Bureau intends to ascertain the possibilities of the alloy of steel and nickel in other branches of naval construction, as well as in the manufacture of armor plate, in which it already has shown such creditable qualities that he is preparing to have made at Washington navy-yard a series of tests which will include proof trials of projectiles made from the new alloy, as well as the usual test of elasticity, strength, ductility, etc.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XVII.

[Written for the PRESS by JAMES H. CROSEMAN.

Silver Mountain Mining District.

Going from the town of Oro Grande, elevation 2625 feet, in an easterly direction, we reach a low pass on the Oro Grande range, distance, 3½ miles. On our way we cross a belt of dolomitic limestone on which a few open cuts have been made to test the character of the stone as a marketable product. In a southeasterly direction, two miles distant, the range attains its greatest elevation, the culminating point here reaching a hight of 4525 feet, its craggy peaks standing out in bold relief against the horizon. To the east, a deep canyon terminates six miles distant on the desert plains. Northeasterly, and nearly on a level with our standpoint, a distinct and well-defined line of croppings of a pearly whiteness, changing to a yellowish hue, is seen on the face of an oval-shaped hill, and about midway from base to summit. These croppings lie horizontally, and course longitudinally with the range in which they are situated. Their color is in strong contrast with the overlying and underlying rocks. Approaching the mountain and examining its structure from its base to the croppings referred to, the formation is composed of a syenitic rock containing spots and stringers of an apple-green hue, technically known as "olvine." This formation constitutes the footwall of an extensive belt of clay, which contains all the elements and properties of the commercial product known as

Kaolin.

A bed of which crossing northerly and southerly can be traced at intervals by exposures a distance of 9000 feet. The hanging-wall or overlying formation is a feldspathic porphyry with the mineral feldspar predominating. Its origin and occurrence is easily accounted for. During a period of volcanic activity a fissure was undoubtedly opened on the easiest line of fracture, which proved to be on the contact of the two dissimilar formations, the crack or opening in the earth's crust permitting the evolution of chlorine and those powerful gases from deep-seated centers bleaching, disintegrating and decomposing the rocky structure through which it passed, chemically formed this kaolin, the best clay for the potter's use known to man. This clay is suitable for the manufacture of all of the finer classes of earthenware. Repeated tests of this product have been made by potters in England, France and the United States, all of whom have pronounced it a good article. Prof. Hilgard of the State University, and Prof. Chas. Schneider of the California State Mining Bureau, have analyzed this clay and class it as a kaolin of superior quality, suitable for the potter's use. Their analysis shows: Silica, alumina, iron, lime, magnesia, alkalines and water in the same proportions as found in the best imported product. The overlying porphyritic formation has also been tested and found to be suitable for the manufacture of the coarser classes of pottery as well as for firebrick, an article of which our yearly importations amount to a large sum. This kaolin varies in color from a pure white pulverulent substance resembling prepared chalk or magnesia to a yellowish-reddish tinge, the discoloration being caused by metallic oxides which can be easily eliminated. The pure white pulverulent product of the mine has been used by the Messrs. Bancroft of this city for the manufacture of crayon for artists' use. A lady residing at the Palace hotel in this city uses it in the manufacture of a face-powder, which meets with a ready sale to her lady acquaintances.

This vein or bed has been opened by a drift crosscutting the lode for a distance of 60 feet. The first 20 feet out into lies in strata more or less indurated and dipping into the hill at an angle of 45 degrees. This is found to be more or less stained by metallic oxides. The drift then entered a pure white pulverulent mass of clay in which occur hard nodules, but still a clay. A shaft has been sunk a few feet in the same substance, other openings having been made on the deposit for a distance of 800 feet, proving its extent and character that far.

Pottery Works.

The town of Oro Grande presents exceptional facilities for the establishment of pottery works on an extensive scale, as it contains in its immediate vicinity all the requisites essential to the business:

1st. Kaolin and clay for porcelain, coarse pottery, and firebrick can be brought from the mine by a gravity tramway.

2d. Water for motor-power can be placed from the river.

3d. Wood from the river's banks can be had at from $3 50 to $4 per cord, also willow for crates.

4th. Coal from Gallup, New Mexico, can be brought here by rail for $8.50 per ton.

5th. The California Southern R. R. or the Santa Fe system can be availed of for transportation of the manufactured products to a market.

6th. Silica, if required, and lead for glazing occur in the immediate vicinity of the town; while borax and soda can be procured from Daggett, only a few miles distant, also connected with this place by rail.

Pottery works, if established here, would give employment to an army of operators and render our country independent of the foreign product in this line.

Whatnot Hill

Is situated 4½ miles northeasterly from Oro Grande Camp, at an elevation of 3700 feet above the level of the sea. Formation, porphyritic, through which courses a quartzite dyke of considerable strength. On and in the vicinity of the contact several stringers and veins of metalliferous quartz occur, carrying the ores of gold, silver and lead. The most prominent and best developed of these veins are the

Whatnot

Strike, north and south walls vertical; ores, carbonate of lead, gold and silver, developed by a tunnel 300 feet in length. Assay value of the ores: Gold, $60 per ton; silver, 20 ounces per ton; lead, 8 per cent. From the adit, four winzes have been sunk 50 feet apart; No. 1, 25 feet deep; No. 2, 19 feet; No. 3, a raise to the surface of 60 feet; No. 4, 30 feet deep. The vein is from 2 to 12 inches wide. The ores are base and require chemical treatment.

The Tressury and the Blind are similar in their general features to the Whatnot, from which they are 1½ miles distant. On the latter, two shafts have been sunk, one 18 and the other 50 feet deep. Ores assay $80 per ton in gold and silver.

These mines are now idle, but they would be valuable properties providing smelting works were in operation at Oro Grande.

Proceeding westerly two miles, we cross the Mojave river opposite Hartman ranch, where there occurs, at an elevation of 2525 feet,

A Vein of Asbestos.

It is situated in the low rolling hills that skirt the river and occurs in a secondary granite formation, with limestone in the vicinity. Here is to be seen an eruptive mass of brecciated rock composed of sharp angular fragments of granite and quartz heavily charged with iron oxides, through the center of which courses a quartzite dyke cropping out boldly. Adjoining and on the southerly flank of the hill, a belt of talcose and chloritic slate occurs, and on the line of its contact there runs a well-defined vein of asbestos 20 feet in width and traceable on its line of strike for 3000 feet. On this deposit two shafts have been put down—one to a depth of ten and the other to a depth of 25 feet.

The fiber of this material is short and mixed with foreign matter containing a fibrous siliceous rock that greatly deteriorates the value of the mass. In all probability, explorations in depth and at other points on the line of the lode would develop a better material—at any rate the experiment would be worth trying.

In a westerly direction and from 7 to 12 miles from Oro Grande, in a low range of hills, are located Galena, North, Central, and West Camps.

North Camp

Lies seven miles in a southwesterly direction from Oro Grande; formation, a magnesian limestone. It contains the following locations, on which but little work has been done:

The Lillie—Strike north 20 degrees west; dip southeasterly 75 degrees; gangue quartz; ore bunchy but rich; assays 234 oz. silver per ton; vein small, carrying brittle silver and chlorides. Vein traceable for 7500 feet, numerous feeders of high-grade silver ore fall in and enrich the veins at their intersection. On the northerly slope of the mountain a group of silver-bearing veins occurs, having a quartz gangue and an easterly and westerly strike, the best defined being the Clip, Springer and Cornet.

West Camp

Lies 12 miles due west from Oro Grande in an isolated mountain; formation, stratified lime, syenite and porphyry, through which runs in a northwesterly and southeasterly direction a series of strong and well defined veins of quartz, carrying the ores of gold, silver and lead.

The Twenty-nine—a three-foot vein with a northwesterly and southeasterly strike, lying between dissimilar walls of limestone, with a quartzose gangue; is highly mineralized and rich in the ores of silver.

Clincker No. 1 has been developed by two shafts respectively 60 and 35 feet deep, lying 600 feet apart; Clincker Nos. 2 and 3 are parallel veins lying 600 feet apart and 350 feet easterly from No. 1.

The Side Issue lies parallel 325 feet west from the Clincker No. 1. This vein is from one to three feet in width and developed by an incline shaft. Ore a copper-silver glance; strike 10 degrees west of north.

The Commercial Lode,

From two to three feet thick, crops for 1500 feet, carrying the ores of copper and gold; walls porphyry and limestone.

The Capital lies 200 feet easterly from the Commercial and courses northerly and southerly; vein from 3 to 26 feet in width; ore averages 15 ozs. silver, developed by shaft, No. 1, 55 feet deep, and shaft No. 2, 69 feet. This vein, which is inclosed between walls of porphyry and stratified lime, is traceable on its line of strike for a distance of 6000 feet. Water for reduction purposes can be obtained from inexhaustible wells 1½ miles distant in the bed of Dry lake.

The lode known as the General lies on the west side of West Camp mountain, in the vicinity of Dry lake. It is developed by a 70-foot incline shaft; ore gold-bearing.

The Boss lode courses north and south, gangue quartz, vein from 2 to 18 inches thick;

formation blue limestone on the east and porphyry on the west; strike north 20 degrees west; ores carry gold and silver varying from $20 to $72 per ton.

Central Camp

Is situated between Galena and West Camp in an isolated butte. The veins here are strong and well defined, with lime on the east and porphyry on the west. They vary from 5 to 10 feet in width, and have been but little developed.

Galena Camp

Lies seven miles westerly from Oro Grande. The hill on which it lies incloses the Lucky Tom Nos. 1, 2 and 3. Vein 20 feet in width; hanging-wall stratified lime; footwall syenite; ores carbonates of lead and silver, developed by a 20 foot shaft.

(*To be Continued.*)

Working Hours.

A writer in *Chambers' Journal* says: A Turkish working day lasts from sunrise to sunset, with certain intervals for refreshment and repose. In Montenegro the day laborer begins work at 5 or 6 in the morning, knocks off at 8 for an hour, works on till noon, rests until 2, and then labors on until sunset. This is in summer. In winter he commences work at 7:30 or 8, rests from 12 to 1, and works uninterruptedly from that time to sunset. The rules respecting skilled labor are theoretically the same, but considerable laxity prevails in practice. In Servia the principle of individual convenience rules in every case.

In Portugal, from sunrise to sunset is the usual length of the working day. With field laborers and workmen in the building trade, the summer working day begins at 4.30 or 5 in the morning and ends at 7 in the evening, two or three hours' rest being taken in the middle of the day. In the winter the hours are from 7:40 to 5, with a shorter interval of repose. In manufactories the rule is 12 hours in summer and 10 in winter, with an hour and a half allowed for meals.

Eleven hours is the average day's labor in Belgium, but brewers' men work from 10 to 17 hours; breadmakers, 16; the cabinet-makers of Brussels and Ghent are often at work 17 hours a day; tramway drivers are on duty from 15 to 17 hours, with an hour and a half off at noon; railway guards sometimes know what it is to work 19½ hours at a stretch; and in the mining districts, women are often kept at truck-loading and similar heavy labor for 13 or 14 hours.

The nominal working day throughout Saxony is 13 hours, with two hours' allowance for meal-taking. In Baden the medium duration of labor is from 10 to 12 hours, but in some cases it far exceeds this, often rising to 15 hours in stoneware and china works and cotton-mills; in sawmills, to 17 hours, while the workers in sugar refineries, where the shift system is in vogue, work for 24 hours and then have 24 hours free, and in too many of the Baden factories Sunday work is the rule.

In Russian industrial establishments the difference in the working hours is sometimes extraordinary, varying from 6 to 20. It is remarkable that these great divergences occur in the same branches of industry within the inspector's district and among establishments whose produce realizes the same market-price.

PUGET SOUND LUMBER.—A lumber pile made of boards each 100 feet long and six feet in width would be an unprecedented sight in the East, says the Philadelphia *Press;* but a gentleman recently returned from a visit to the Northern Pacific ocean says that piles of timber such as that are common at the mills of Puget Sound. 'Boards 100 feet long and six feet wide, without a knot in them," he says, "are common cuts from gigantic fir trees of the Puget Sound forests." These trees grow to the enormous hight of 250 feet, and the forests are so vast that although the sawmills have been ripping 500,000,000 feet of lumber out of them every year for ten years, the spaces made by these tremendous inroads seem no more than garden patches. Puget Sound has 1800 miles of shore line, and all along this line and extending thence on both sides miles and miles farther than the eye can see, is one vast and almost unbroken forest of these enormous trees. An official estimate places the amount of standing timber in that area at 500,000 000,000 feet, or a thousand years' supply, even at the enormous rate the timber is now being felled and sawed. The timber belt covers 30,000,000 acres of Washington, an area equal to the States of Vermont, Massachusetts, New Hampshire and Connecticut.

IT IS rumored that J. J. Tobin, State Labor Commissioner, is about to commence a systematic crusade against wildcat insurance companies; that he intends by actions in Court to thoroughly ventilate the manner in which some of the assessment and endowment companies have been gulling the public. If he only succeeds in reaching the right companies he will accomplish a grand work. It has been said that some of the old-line companies have placed quite a sum of money at the disposal of Mr. Tobin in order that he may defend himself against suits that might possibly be brought against him by reason of these investigations. We are inclined to discredit this, although Mr. Tobin ought not to be made to bear the expense of defending himself while engaged in the discharge of his duties.

A Californian in Holland.

Dr. W. M. Ryer, owner of Ryer island and well known in discussion of tule-land reclamation, writes from Holland to the *Evening Bulletin* as follows:

Within the boundary of the State of California are large tracts of swamp and overflowed lands which, when reclaimed and subjected to the cultivation they are susceptible of receiving, will by their products become capable of supporting a population equal in numbers to that which now inhabits the entire State. To many persons this statement may appear extravagant, and to others, who have doubts upon the practicability of reclaiming and cultivating these tracts of land, it may seem a declaration which should be followed by the proofs. The misfortunes which have attended the efforts to reclaim the swamp lands of California present many good reasons to doubt a result so important, and if it is not shown to be more from the inefficiency of the means used than from the impracticability of reclaiming this land, then those who doubt do so wisely.

At this time the swamp and overflowed land of California is either in a condition as profitless as when first surveyed or is imperfectly reclaimed and carelessly cultivated. To go upon these dismal swamps and look at them as they are in a natural state, or in the so-called condition of reclamation, it becomes difficult to bring the mind to the belief that upon land exactly the same in the quality of its soil and in its relation to the floods of the rivers and the tides of the sea, there now is maintained and has existed for centuries as high and refined a civilization as can be found among the nations of the earth. In relation to these waste lands of California, it may be said, "What has been done may again be done when like conditions exist." Upon swamps originally like the overflowed land in the Sacramento and San Joaquin valleys and on the margins of the bays of San Francisco and Suisun in the centuries past, a people founded a nationality whose record is among the proudest for deeds of dauntless courage on the fields of battle and for daring and enterprise on the seas.

To give any portion of the military or naval history of this remarkable race is not within the line or intention of this article; the desire is to briefly direct your attention to the mighty works of civil engineering and patient labor done on the lowlands of the Netherlands to illustrate what may be done on the lowlands of California.

The Manner of Reclamation.

The entire Kingdom of the Netherlands contains 12,650 square miles. This is an amount of land equal to a strip of country 42 miles wide and 300 miles long. Such an extent of land could be taken from the San Joaquin and Sacramento valleys and leave a marginal surplus. The number of the population, as estimated upon the last census of 1886, is at this time 4 800 000 people. The larger part of the entire State is protected from the storms and tides of the North Sea and from the currents and overflow of the river Rhine and other rivers of lesser magnitude by sand dunes and by dikes. The land thus protected from the ravages of the sea and rivers is drained by canals, whose water is pumped by windmills and by steam-power into the rivers or the sea, which at many places have an elevation of from 15 to 30 feet above the level of the canals. Do not understand that the greater portion of the reclaimed land in Holland is of a level so low as these figures would indicate, for these depths are only found in such "Polders" as the Haarlem, the Beemster, and perhaps a half-dozen like reclamations.

The last reclamation of importance was made in the construction of the North Sea Canal, extending from Amsterdam westerly to the North Sea, a distance of about 18 miles. This work was commenced by the construction of an immense dam of 1¼ miles in length, across an estuary of the Zuyder Zee, known as the "i j" (pronounced I). In the center of this dam were made five stone locks, three of which are adapted to the passage of vessels and two are for the regulation of the water in the canal. At the North-sea entrance to the canal there are three locks of granite, brick and iron, which act as barriers to the waters of the ocean and permit of the entrance and exit of the largest steamships engaged in commerce between Amsterdam and other seaport cities. This great work was commenced in 1865 and finished in 1876. The canal extending from Amsterdam to the Helder, through which the commerce of Amsterdam was formerly conducted, became insufficient as the tonnage of modern vessels increased.

To realize the importance of this great enterprise, imagine a dam built across the Bay of San Francisco from the drydock or Potrero Point to the nearest shore of Alameda, and at a distance of three-quarters of a mile from the city shore, and in the Bay of San Francisco, five enormous locks of granite, whose foundations are 40 feet below the surface of the water. Now see with your mind's eye two long levees or dikes whose foundations sink nearly 40 feet below the water level, and constructed as jetties are when made at great depth, but watertight; these levees or dikes running parallel to each other at a distance of 300 feet and extending a distance of 15 miles toward San Jose, and in the middle of the bay.

Now fancy, or bring your imagination to picture, the largest steamships which enter the Bay of San Francisco steaming through this canal, and all the water now in the bay on either side of the canal pumped out, and the bottom of the bay transformed into dry land, upon which an industrious and frugal people have built towns and happy homes, and have cultivated the land into pasture and grain-fields.

The steamships which pass from Amsterdam to the Atlantic ocean course along a canal whose waters are, for long distances, 20 feet above the land on both sides of it. This land was, 20 years ago, the holding-ground for ships' anchors; it is now cultivated into productive fields of grain or is devoted to pasture for cattle and has upon it thriving villages. The immense quantity of water which the bay contained was pumped into the ship canal after the dikes were completed, and by this channel they were discharged into the sea. The land thus recovered from the ocean was sold to the farmers for about $450 per acre, and it thus paid about one-third of the cost of the canal. The city of Amsterdam paid about one-fifth of the cost of the canal, the balance was paid from the National Treasury. As a work of water engineering this canal and the approaches to it from the North sea and the city of Amsterdam, rank among the highest of modern achievements.

To fully appreciate the engineering ability demonstrated by the works of Holland engineers in the construction of dams, dikes, jetties, etc., you should go upon those which are exposed to the storms of the North sea, which at times rage with all the violence of the Atlantic or Pacific oceans. Those who doubt the practicability of reclaiming the marsh lands of California should stand upon the dikes and dams of the Netherlands and the parts of North Germany contiguous thereto when the sea breaks during storms, with all the violence seen at Seal Rock or the entrance of the Bay of San Francisco, upon the outer side of those dams and dikes, while on the inner side, and lower than the natural surface of the sea, the industrious and happy people pursue their usual course of life, having confidence that no danger exists behind such barriers.

Unfortunately, practical water engineering, as taught in Holland, is not taught in any of the collegiate institutions of America. Certainly none of the graduates of these institutions have demonstrated any special knowledge of this subject in the works in California. With works constructed as they are in Holland, the swamp lands of California would be cultivated without fear of overflow, and the product of this cultivation would contribute immensely to the wealth of the State.

Canals of Irrigation and Drainage.

After the land is securely diked, the next work of importance in the reclamation is the drainage and the irrigation. As the largest portion of the reclaimed land in Holland is below the river or sea level, it becomes necessary to dig canals to drain it and to raise the water from these canals to such channels as will carry it to the sea. Holland is a country where the rainfall occurs in every month of the year, and it is more abundant than in California, so that both rainfall and seepage require lifting to higher levels.

In the "polders" or lands reclaimed from the water, the canals are made at distances from 400 to 800 feet from each other and usually parallel. The end sought is to drain the land when too wet, to irrigate when too dry, and to partition the land into fields, the canals acting as fences and as resources for manure, for the vegetation which grows in the water is raked out, put in piles, rotted and spread on the land to enrich it. The reclaimed land of Holland is as productive in grain, vegetables and pastures as the best found in Europe, and seems to have lost but little of its riches, even where cultivated for centuries. This is due to the depth and richness of the soil and the application of manure taken from the canals and the beds of peat. The division of the farms into fields by the canals enables the farmer to confine his cattle on one field, while the others are reserved for the harvest of hay, grain or other products.

The Holland Windmill.

Among the structures illustrated by paintings and engravings until they have become associated with the name of Holland, and come before the mind when it is directed to this country, are the windmills. Comparison of their unique and graceless outlines are made with modern windmills much to the credit of the latter, especially so when the valuable services rendered by the former are lost sight of.

The Holland windmills are usually built upon piles driven into the ground until a firm foundation is reached. They are either round or many-sided, with a base of from 25 to 50 feet in diameter, decreasing in dimensions to their summit, and are of a hight of from 40 to 60 feet. The fans are of great length, usually from 15 to 30 feet, always four to each mill, and made by crossing at right angles two very large timbers of from 30 to 60 feet in length. The fans are made oblique by a framework of light slats, so crossing as to support the sail. Over this frame a canvas sail is drawn when required for use and withdrawn when it is desired to have the mill motionless. The mills are so constructed in the interior that each revolution of the fans will cause, by a system of cogs, many revolutions of an Archimedean screw pump, which is placed at its lower part in the canal of supply, and at its upper part to the canal of discharge, at an incline of about 40°. These screws are from four to eight feet in diameter, and are so located to confine the water that in a fair wind a great volume of water is raised from the lower to the higher level.

Before the use of steam pumps these mills were a necessity in the reclamation of the swamps of Holland, and as they are very effective and are less costly in their workings than steam machinery, they have continued to keep in a cultivable condition the larger portion of the land. These mills were and are now used as saw and grist mills, and for these purposes they do the work required well. For the simple lifting of water it is doubtful whether modern science has discovered anything better than the Archimedean screw, whether propelled by wind, water or steam; and it is also doubtful whether there are any more effective windmills in existence, or any more capable of resisting the storms and tempests than the windmills which are so prominent in the landscapes of Holland, and which so often suggest the ludicrous to the traveler.

As valuable for the purpose of drainage as are the windmills, it must not be understood that all the improvements of modern steam machinery have been omitted. On the contrary, the steam pumps used in pumping out the waters of Haarlem lake and the bay known as the "i j," at the time of their reclamation, are models of effective machinery.

The Coals of Puget Sound.

The coal measures of the Puget Sound basin consist of alternate beds of yellow and gray fine-grained sandstone and very fine gray arenaceous shales interstratified with many beds of carbonaceous shale and coal. Mr. Willis in his report says: "Looking at the Puget Sound basin as a whole, the coal measures extend from beyond the British boundary south almost to the Columbia, and from the Pacific ocean eastward up into the Cascade range to elevations varying from 800 to 5000 feet above the sea. The coals of this district range in quality all the way from lignite, which still retains a woody structure, to anthracite. The magnificent forests so extensive on the western slope of the Cascades, with their luxurious and dense growth of vegetation, make difficult the development of these coal-fields, as well, also, as the determination of their extent. Coal, however, is known to exist from the northern to the southern boundary lines of the State, through a belt ranging from 10 to 30 miles in width. The general coal formation in the State is placed much the same as that of the anthracite of Pennsylvania, with the sides of the basins dipping at all angles from 15 to 90 degrees. The number of coal beds in the field is undetermined, but, judging from the great number of exposures and the varied character of the beds and rocks, it is large. Those already examined vary in thickness from 1 to 45 feet."

Coal from several different localities has been tested and found to produce excellent coke. With only a few mines developed to any extent, and with a greater number of our most promising mines not sufficiently developed for shipping, there was an output during the year 1889 of 1,000,000 tons, valued at $4 500,000. Of this amount, King county produced 450,320 tons. The output is increasing as rapidly as the capacity and number of mines will permit. The output for 1890 will considerably exceed that of the past year. Shipments from the Gilman mine alone, operated by the Seattle Coal & Iron Co., have been 29 000 tons from January 1st to June 1st. This mine is now producing over 350 tons per day, and as the shaft is extended the quality of coal improves. The total output of coal from Seattle from January 1st to June 1st, 1890, was 201,130 tons. When it is borne in mind that with the exception of two very small mines in California, producing coal of an inferior quality and in quantity not sufficient to be taken into consideration, and an annual output of 40,000 tons of an inferior quality from Oregon mines, there is no other State than Washington on the Pacific Coast possessing coal, the value and future of this branch of industry can be understood.

IMMENSE DEPOSITS OF TIN.—Joseph Hare, editor of *The Tin Miner*, of Hill City, S. D., in speaking of the tin mines at that place, says: "Hill City is situated exactly in the center of the tin belt, which is in the shape of a half-moon, and is about 30 miles in length and three miles wide. We are 28 miles from Rapid City, the nearest railroad point. The richness of these mines is simply wonderful, and one who has not been there can hardly believe it, but I state a fact when I tell you that there is enough tin on the dumps and in sight now to supply the United States for five years. As soon as the big mill is started at Hill City, we shall be able to ship the tin out in bars. Some of these mines have been pushed down 240 feet, and the deeper the richer. The vein is eight feet thick, and dips toward the east at an angle of about 45 degrees. Some of the mines average 27½ per cent of metallic tin, and the whole ledge averages 10 per cent. The capitalists interested are mostly New Yorkers and Englishmen. The larger part of the capital is furnished by New York men."

THE Seattle *Press* says that California redwood is being shipped to that city in large quantities.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

FROM SUTTER CREEK.—*Ledger*, Oct 25: The activity and unusual stir around the Wildman is gradually abating. Many of the hands that have been engaged in digging ditch and laying the pipe have been dispensed with; the laying of the pipe being almost finished. The mortar blocks are in place, the battery posts are up and the floor laid. The mortars are delivered and will be in their places by the middle of next week; the stamps will he in the guides and ready to drop. The Frue concentrators are to he used and are on the way. Mr. Knight feels confident that be will have the mill in motion by the 10th of December. He has H. G. Murray in charge of the job. At the Sutter Creek mine they have extended their drift 240 feet on the 60-foot level, and made two upraises to the surface all through what they think is paying ore. Stoping is now in order. The 10-stamp mill is about completed and crushing will he commenced about the 25th.

ON THE NORTH STAR.—Develnpments here are progressing slowly. The ground is hard in each drift. The outlook is not what migbt be called bright and the stockholders are getting a little discouraged. There is some talk, bowever, in case there is nothing encountered, of cutting through the green stone east, as there is a possibility of the ledge being considerable farther east than was anticipated.

THE LINCOLN has been taking a rest for a few days, as the water has been turned off to enable them to repair the ditch and put it in order for the coming winter. There has been a force of men for nearly a week cleaning out and enlarging the ditch so that they can get more water to the mill. The ore in sight is of a paying character and sufficient to run for some time.

Butte.

WORK BEGUN.—Oroville *Mercury*, Oct. 24: The work at the Golden Gate mine is now, as ever, progressing with the greatest possible speed. The water is being pumped from the pools in the channel into the sub-flumes and to-day the work of stripping began on the river bed.

Del Norte.

GOOD QUARTZ.—*Record*, Oct. 25: Robert Melson came in from Big Flat last Sunday, bringing some fine specimens of quartz, discovered by him between Hayne's Flat and Big Flat. The quartz brought in is about the size of an almond, and is full of gold as large as a pin bead. Robert thinks he has struck the ledge, and if he has he can soon sign his name to a check with more than four figures.

BEACH SAND.—The Big Lagoon beach in Humboldt county has been located for mining purposes. The sand is said to he very rich.

Inyo.

MODOC AND VICINITY.—*Independent*, Oct. 24: The news from Lookout and the Modoc mines is very good. On Sept. 21st Frank Fitzgerald resumed work after the vacation with nine men. The force has since been increased to 21 men. Another team is necessary to haul ore, as the output is greater than the two teams now at work can take away. The first shipment since resuming work was made last Wednesday, the quantity being 21,000 pounds and the net value $7990. Stoffle, St. Clair & Co. have seven men at work on lease and are doing well, even after half of the ore goes for royalty to the owner of the mine, Mr. Fitzgerald. J. J. Gunn has resumed work on the St. John mine with a force of seven men.

AT CERRO GORDO.—A large amount of fine silver-lead ore is being taken out of the Keefe & Dunpby mine at Cerro Gordo. It is the property of the Union Con. Co. Work goes actively along in the old Union shaft, which is now about cleared out and put in condition to the bottom, 900 feet, for exploitation. No ore is being hoisted, though there is said to he considerable in sight in the old workings, but which cannot well he taken out until the ground is better secured. The old dumps, containing thousands of tons of waste and ores mixed, are being worked over with jigging machines, and are paying handsomely. The Farrington team brings down to Keeler a carload of shipping ore every day in the week, Sundays excepted. About 25 men are at work on the hill, mostly for the company.

THE MINNEATTA. — Near the Modoc is the Minneatta, the property of Fitzgerald and J. J. Gunn, and under lease by the latter, who this week has put on a number of men for the resumption of active work. This is a very fine paying property—one of the best in the country.

WILL LAST A LONG TIME.—It will take years to exhaust the ore already on the dumps of the Defiance, Cerro Gordo, Darwin and other mines in this region of country. The ores from the several lead mines above mentioned, when prepared for shipment, run from 45 to 65 per cent in lead and rarely, if ever, less than 70 ounces in silver, and some much more than that. These remarks are all from the casual observations of a hurried visit made without a thought at the time of a report in any form, therefore they are not offered as being either full or strictly correct. As remarked above, the mining outlook in general at this time is better than it has been for a long time.

ABOUT DARWIN.—The mining interests about Darwin are looking up considerably. Gould & Jackson, after about 1½ years of steady work in driving a tunnel on the Gypsy Queen, and, so far, without a dollar in return, have at last opened up quite a fair body of good ore and hope soon to get out a solid carload for shipment. The Lucky Jim is working six men and shipping considerable ore. The Defiance, Jas. McDonald superintendent, is working nine men in the mine and about twice that number on the dump and on the pipe-line, supplying the camp with water. There are bundreds of tons of rather low-grade ore in sight in the mine, and other bundreds of tons of fine ore in the dumps. All this, together with all the spargrades from the mine, is to be handled with crusher, jigs and rockers, all of which can be done cheaply and rapidly as soon as water is piped on to the ground, as it soon will he. With these added processes, particularly the jig which seems to be just the thing for lead ores, there is no doubt but this mine will he one of the best-paying mines of the country. A good deal of high-grade ore is being sacked directly from the stopes, aside from all this just alluded to. Mr. P. Reddy, principal owner, is rusticating at the mine, and no man is more deserving of the biggest success for pluck and bang-up than is he. There is no question now but that he will win. He is replacing some nine miles of water-pipe and doing much other expensive preparatory work.

Nevada.

WORK ON THE CHAMPION.—*Herald*, Oct. 25: Some important improvements are under way at the Champion mine. The quartz-mill is to be raised several feet in order to put in a rock-breaker and make other changes in the arrangement of the mill which will facilitate the handling of ore. The Champion Co. is having the old Merrifield mill, which it purchased some time ago, torn down, and will utilize such of the machinery as it needs in the other mill.

WILLOW VALLEY DISTRICT.—The new works of the Federal Loan mine in this district are nearing completion, and in a few days operations will be resumed. As yet it is not possible to work a large force of men, but it will not he long before the number of men employed will be greatly increased. Work on the Lecompton ledge in the same district is progressing quite favorably. Some fine rock is being taken out by Ott & Co. and a crushing will soon be had.

RIGHT UNDER IT.—The Harmony Drift Gravel M. Co. after several months of persistent work, are rapidly approaching the channel for which they have been running. An upraise made Monday disclosed the fact that the channel is only four feet above the tunnel. From the hole made up to it there came some genuine quartz gravel, such as gold is always carried in. The tunnel, or present drift, will not he quite low enough to work the lower portion of the claim through, but it will enable the owners to work out a majority of the ground. The Harmony's past record proved the channel to be rich, and there is no doubt but the present company will reap a rich reward for their enterprise. Gold will be coming out of the mine very soon now.

Placer.

AT THE MAYFLOWER. — *Republican*, Oct. 25: There are about 80 men employed at the Mayflower mine near Forest Hill. Half of them are miners underground, and the others engaged in various preparations for the winter work. The mill is crushing 12-hour runs five days in the week, and is crushing 375 tons of gravel a week with good pay.

Plumas.

A FINE PROSPECT.—*National*, Oct. 25: Last Saturday F. B. Whiting brought to this office a fine specimen of gold-bearing quartz recently taken from his claim at Rich bar. He has been engaged for several years in developing a ledge in that vicinity and now firmly believes that he has discovered the lead to a large body of gold ore. In former days Rich bar was exceedingly productive in the yellow dust, and considerable quantities are yearly shipped from that locality. The source of this great wealth has been eagerly sought after by many and it is to be hoped that Mr. Whiting has at last struck the true channel. The rock displayed was enormously rich and numerous croppings of free gold stood out prominently from their beds, surrounded by specks of glistening gold thickly scattered throughout the piece. Plumas county can furnish the quartz gold, and plenty of it, but to possess it one must get in and dig.

San Diego.

MORE MINES SOLD.—Julian *Sentinel*, Oct. 24: H. H. Davis, of Banner, this week sold to W. M. Goodman, for a good round sum, the Seventy-six mine. Mr. Goodman contemplates developing the property at once. He has a good vein of ore on the surface, and will mill it as it is taken out at the new mill now being erected by the Gold King Mining & Milling Co. Charles Bacon has sold the Joe Dandy mine and accompanying mill-site to Waldo S. Waterman and Jerome McDonald. The price paid was satisfactory all around and the property has gone into hands that will insure the working of the same.

BLUE HILL AT BANNER.—A rich ledge has been struck in the Blue Hill mine in the tunnel run into the mountain 150 feet. Several thousand dollars have already been taken out, the ore showing being considered extremely good.

Shasta.

THE TRINITY MINE.—*Free Press*, Oct. 25: This property, located at Dog Creek, is to be incorporated under the name of the Trinity Gold & Silver Mining Co. A tunnel 100 feet in length has been driven on the ledge, which is in the mountain 80 feet from the surface. The ledge is five feet wide in ore that averages between $60 and $70 to the ton. Ten stamps will he erected inside of 20 days. All but two miles of the wagon-road leading from Delta to the mine, a distance of six miles, is completed. Mr. Champion, owner of the Trinity, has also recently purchased an extension to that mine, and expects to develop it into a valuable property.

THE THOMSON MINE.—Considerable development has been made in this mine, located in the Lower Springs district. Mr. Thomson, after purchasing this mine of B. Swasey, commenced its development in a systematic manner, and while he has met with some discouragements, there is a fair showing at the present time. Visiting this property last Sunday, we found an open cut and a tunnel running in a westerly course about 300 feet. The tunnel then runs at a right angle some 30 feet northerly. About 17 feet distant from the commencement of the north tunnel another branch tunnel has been run, and at a distance of 37 feet there has been struck quite a ledge of rich quartz perhaps two feet wide; over the roof of the tunnel also appears quite a quantity of good ore. The ore has assayed all along as high as $500 to the ton. The only trouble has been the pinching out of the ledge, but now at quite a distance under the hill the ledge appears to he widening out, and William Sublett, who has charge of the property at present, thinks that further developments will produce a large ledge. It is proposed to sink a deep shaft with three compartments.

Sierra.

TO START UP.—*Tribune*, Oct. 24: The 40-stamp mill at the Mountain mine will start up to-morrow afternoon. This is an important event in the history of this district and everybody will hope that the promoters of that great mining enterprise will reap a profit of a thousand fold. Under the experienced management of Supt. R. B. Harper, the mine has been put in splendid condition and promises to outdo any of them as a bullion-producer.

GOOD FOR THE YOUNG AMERICA.—About the best news that it has been our duty to chronicle for some time is the striking of the vein in No. 4 tunnel at the Young America mine. It was encountered last Monday. Mr. A. C. Busch was up there the day following, and he reported that so far as the ledge was opened up it looked fine. Some quartz that he brought down prospected well in free gold.

THE OUTLOOK GOOD.—A great many of the old-timers are of the opinion that the outlook for prosperous times in this district was never better than it is at present. Well, why not? The mines are looking well and there is a great deal of prospecting going on in these hills. The ledge on which Jos. Perry and John Wilson are operating, located just north of town and adjoining the Sierra Buttes mine, is looking well. The parties expect to mill some of the quartz shortly.

TAPPED GOOD ORE.—*Mountain Messenger*, Oct. 25: The lower tunnel at the Young America quartz mine, tapped a ledge of rich quartz 18 inches wide (it is said) a few days since; the poorest of the rock was estimated to pay $14 a ton, and the richest many times that. This assures the future of this mine as a gold-producer.

THE SIERRA BUTTES MINE.—*Tribune*, Oct. 15: The Buttes is not to he dismantled or in other words abandoned. It is too late in the season to do much now, but next year the 20-stamp mill at No. 7 will be rebuilt and it will he erected in a place where snowslides will not he likely to reach it. In addition to taking out enough ore to keep the mill going there will he prospecting going on, and perhaps the future history of this mine will figure something after the Plumas Eureka, which mine our readers will remember went down to a very low ebb a few years ago. In fact operations were about to he suspended there, but a little further prospecting was done, a new body of ore opened up, and the mine to-day is paying handsome dividends. The Sierra Buttes is a big mountain and the mine named after it has been a big institution, too, but there is no reason to suppose that the great hill has yet delivered up all of its riches.

Siskiyou.

FROM HUMBUG.—*Telegram*, Oct. 25: A placer mine, right below McCook's mill, is operated by Jim O'Conner and his partners, who have no complaints to make regarding success. Jim was formerly connected with the Occidental Hotel of San Francisco, but thinks he likes mining best. Hegler Bros. & Aldrich at the Comstock No. 2, have been running their five-stamp mill night and day this summer, crushing the ore from a well-defined ledge of generous size, so favorably located that a minimum of labor will produce great results in rich quartz. The Spencer mine has the reputation of being the best piece of property on the creek. It has been under its present management less than two years; in that time it has paid for itself and also for improvements and fixtures of a first-class character.

THE NORTH STAR.—This mine on the head of Cornish gulch has been worked by a San Francisco Co. about a year and a half. The surface developments consist of a number of shafts, cuts and strippings, exposing the ledge and pay ore for a distance of over 1000 feet. The underground workings of the mine consist of a main tunnel 300 feet in length. At that point it crosses the ledge at a depth of 80 feet. Here a level is driven along the vein a distance of over 300 feet, showing a well-defined ledge averaging 18 inches to two feet in thickness of $30 ore. Winze or air connections are made to the surface. The arrangements for handling and reducing the ore are such as to produce the greatest results from a minimum of labor, and the entire works are a model of neatness and convenience.

ON LITTLE HUMBUG.—Over on Little Humbug Fabricius and Rider have been working a placer claim for some years. They have run a tunnel recently and were rewarded last week by striking a channel 50 feet wide which yields the best pay in coarse gold that they have worked in for a long time. I. F. Roberts, an experienced mining man of Colorado, has recently located on Little Humbug, and it is very sure that the place will justify his work upon it. He is a practical assayer and has found a ledge that he says will make the old settlers open their eyes when he gets at work on it.

Trinity.

GLOBE MINE.—*Journal*, Oct. 25: Dave Tighe reports having sunk 15 feet on the Globe mine and the ledge is about four feet wide in the bottom of the shaft and averages well. More work will be done as soon as proper arrangements can he made to hoist the ore from the shaft.

EXPERTS ARRIVE.—Hon. J. H. Neff of Placer Co., accompanied by J. B. Hobson, arrived Monday on a visit to East Fork to take a look at the mines in which Mr. Neff is interested. They left Thursday.

Tuolumne.

GOOD POCKETS AND PROMISES. — *Independent*, Oct. 25: The Fuchs mine on Sawmill Flat, owned and operated by Oliver, Oaks & Co., yielded another pocket last Monday; between $4000 and $5000 were realized. The Faxon mine on Saratoga hill is looking very rich and promises to yield considerable gold before long. The Sanguiseppi mine is looking as well as ever, and last week Supt. Whorf let out a contract for extracting ore by the ton.

NEVADA.

Washoe District.

ON THE COMSTOCK LODE.—*Territorial Enterprise*, Oct. 26: The following table is arranged from the weekly reports of the mining superintendents, and represents the number of tons of ore crushed the past week, value per ton according to battery samples, and totals:

Mine.	Tons.	Value.	Total.
Con. Cal. & Va.	1,610	$22 14	$35,645
Belcher	328	23 12	7,583
Crown Point	440	13 73	6,481
Challar	535	18 50	9,897
Alta	315	18 00	5 670
Yellow Jacket	546	18 00	9,828
Overman	368	17 00	6,265
Justice	191	26 03	4,997
Savage	390	22 27	19,152
Occidental	259	22 31	5,778
Totals	5,453		$111,287

The above figures are given and calculated upon the basis of the value of silver at par, or 1 29.29. About 56 per cent of the bullion is silver. If the mills work the ore up to 80 per cent of the battery assays, the yield of the Comstock would be for the past week, $89,029.60. The discount on silver would be on 56 per cent of the latter sum, or on $49,856, $12,700, leaving a net product for the past week of $84,444, which is $7860 more than it would he at the price of silver under Grover Cleveland's administration. The yield of the past week may be properly used as an average weekly yield for the 52 weeks of the year 1890. This would make the product of the year $4,435,528. Last March the *Enterprise* estimated that the yield for 1890 would be $5,000,000 and the *Chronicle* estimated it at $8,000,000.

SIERRA NEVADA.—The southwest drift started on the 630 level has been advanced 45 feet in a soft porphyry formation, showing some seepage of water.

UNION CON.—East crosscut No. 2 from the north lateral drift, 1465 level, extended 32 feet; total, 160 feet, continuing in soft porphyry carrying clay slips and fine lines of quartz.

MEXICAN.—On the 1535 level the new winze has been sunk 20 feet during the week—total depth 65 feet. Bottom in soft porphyry.

OPHIR.—From the prospecting winze sunk below the sill floor of the 1300 level we have followed the streak of ore in a northeasterly direction, continuing to extract some ore therefrom. This streak is narrowing and the ore becoming of poorer quality.

CON. CALIFORNIA & VIRGINIA.—1200 level—Continue the extraction of some milling ore along the line of the north drift. 1300 level—Ore of a fair quality is still being extracted from the junction with the upraise. 1500 level—Ore extraction continues on this level north and south from the upraise connection with the drift northwest from the old stopes. 1600 level—Have continued to extract ore along and above the line of the drift run east through the old stopes on the sill floor of this level. We are also working southerly from this drift, stoping out ore. 1650 level—During the week we have taken out ore of the usual quality and quantity. North lateral drift from the Con. Va. shaft has been extended 191 feet. East crosscut has been extended to 77 feet, connecting with the northwest drift from the C. & C. shaft. Spots of ore are found along this crosscut. 1750 level—The air fan, together with pipe connections completed, and have resumed in the face of the drift southwest from the north drift from the C. & C. shaft, which has been reopened a distance of 190 feet, repaired and retimbered. There has been extracted during the week from all parts of the mine 1595 tons of ore, which was shipped to the Eureka mill; battery sample assays show an average value of $22.14 per ton; 1610 tons milled. Bullion shipped to the Carson Mint assay value $41,474.

Cedar District.

IMPROVEMENT.—Pioche *Record*, Oct. 25: The Banks Bros. among the first locators in this district, report great improvement on their mines. In one of their mines a small stringer of ore was found of good grade which gradually opened up as they progressed, and now at a depth of 12 feet it is two feet wide and the average assay is 200 ounces per ton. Development will he continued and work pushed as fast as practicable. A complete working outfit has arrived, and the material will he used in developing mines recently purchased by outside parties. W. S. Gnthe has purchased a one-fourth interest in the McGuire & Co.'s mines. These mines are reported to he fine property, and large quantities of 100-ounce ore in sight.

Hawthorne District.

RICH ORE. — *Territorial Enterprise*, Oct. 23: The Confidence mine in the Gillis range, Esmeralda county, belonging to Knapp & Laws of Hawthorne, is a very valuable property. Recent results from ore worked at the Mt. Diablo mill ran 25 per cent copper and from 700 to 800 ounces in silver per ton. The property paid four dividends during the summer months.

MINES ATTACHED.—A United States marshal recently levied upon the mining properties of the Manhattan Co. at Austin, for $150,000. The old Manhattan mill, which has ground out $1,000,000 on the average for about 25 years, has been dismantled, and what little ore is extracted from the mines of that once busy district has to he shipped to Salt Lake or elsewhere for reduction.

MT. DIABLO MINE.—The Mt. Diablo mine, Candelaria, is making usual development progress and showing splendidly in all quarters. It has paid $189,000 in 19 dividends, and there are many other dividends in sight. The mill runs right along, doing all that is required of it.

ORE STRIKE. — Walker Lake *Bulletin*, Oct. 22: Silver ore assaying $500 to the ton has just been struck in one of the company's mines at Ione, Nye county.

ALASKA.

GOLD, SILVER AND COAL.—The schooner Dora, lately arrived from Alaska, picked up on her way down from Oonalaska several miners at Unga island, where the Apollo Con. M. Co. is developing some valuable gold and silver mines. Thomas Pillington, who returned on the Dora from an eight-months' stay at Unga, says that the company is operating a five-stamp mill which was erected last spring, and the outlook for the mines is very bright. The Co.'s coal mines at Tbin Point, 43 miles east of Unga, promise development on quite a large scale. During last summer, 800 tons of coal were mined there and supplied to Government vessels and to the Alaska company's steamers.

ARIZONA.

ANOTHER TURQUOISE STRIKE.—*Prospector*, Oct. 20: Si Bryant has made a strike in his mine at Turquoise that is said to he an immense one. He worked through into a cave which is ore on all sides and the bottom of it shows 30 feet. It is said to he the biggest strike yet made in that camp. No man deserves success more than he and his friends will he glad to hear of it. This camp, about 27 miles from Tombstone, may become a greater one than Tombstone. The G. W. Seaverns silver mines are here.

GOOD REPORTS.—Prescott *Courier*, Oct. 25: Dave Gruhh, just from Hassayampa district, says mining is all right there. We have similar news from Big Bug, United Verde, Bradshaw and other districts. Large teams, hauling gold sulphurets from the Congress, arrive here each day. Wm. Conners

owns ledges on Boulder creek, one of which has assayed as high as $500 a ton, gold. Top rock assayed $100 a ton. The Catoctin mine, Hassayampa district, is looking exceedingly well. The ledge is almost five feet wide and very rich in silver. It is a regular dividend-payer. Ex-Governor Tritle has bought the Rubert mill and some mines near Skull Valley, from Messrs. Russell, Cowper and Rubert.

MOHAVE COUNTY.—*Miner*, Oct. 25: The lower levels of the Esmeralda mine are looking fine, and a good showing of ore is being uncovered. It is rumored that the Diamond Joe mine will soon start up with an American as superintendent. Rogers, Shippee & Sherrick have struck a streak of gold ore on the Tintic that goes over $100 in gold and about 15 per cent in lead. We don't know what the exact width of the streak is, but they have taken out chunks as big as a whisky barrel.

THE SILVER KING.—*Journal-Miner*, Oct. 22: Another rich strike is reported to have been made a few days since in the Silver King mine. A good-sized body of ore was encountered which goes $400 to the ton.

COLORADO.

GEORGETOWN ITEMS.—*Courier*, Oct. 18: The largest and best body of ore yet found in the Oneida mine was encountered recently. Lynch and Ward brought in a jack trainload with ore from the Cashier near Argentine Pass last week that returned at the mill 165 ounces silver to the ton and 12 per cent lead.

CLEAR CREEK NOTES.—Idaho Springs *News*, Oct. 24: The Commonwealth mill is working night and day this week. John Davis has taken a contract to drive the Lincoln tunnel a distance of 1000 feet. Chamberlain & Co.'s sampling works have been crowded with ore during the past week as they never have been in their past history.

ASPEN NEWS. — *Times*, Oct. 23: The roads have been so muddy of late that the ore-haulers of the Little Annie Co. have had a hard time of it. The company has been retarded in work by having to procure greater pumping machinery. News from the Black Queen mine at Crystal partakes of the bonanza character. Since the development of the mine was last spoken of in these columns, the rich ore body has been followed up a considerable distance without any limit having been reached. An important strike was made yesterday in the Silver Star. It is another illustration of what deep mining will do, and the bonanza properties of Tourtelotte, which have been great producers from ore bodies near the surface, may have yet far richer mineral down deep in the earth.

DAKOTA.

DEADWOOD DISTRICT.—*Pioneer*, Oct. 23: The Maggie mine of Ruby Basin is now working 12 men and taking out from 25 to 30 tons of ore daily. The ore is all high grade, averaging between $40 and $46 a ton.

SILVER QUEEN.—The Silver Queen of Galena will shortly recommence taking out ore for shipment to Omaha, when the railroad reaches Galena.

NEW DISCOVERY.—A well-known gentleman of Deadwood was exhibiting some samples of ore yesterday which he claimed would go $50 a ton. He stated that the rock was from an entirely new district, but refused to divulge the whereabouts of the El Dorado.

RICHMOND.—The Richmond at Galena, which has been shut down for the last two weeks, started up again on Monday morning.

IDAHO.

SILVER CITY PROGRESS.—Silver City is to have an ore sampling and purchasing works. This will greatly assist mine development in that section.

ENGLISH CAPITAL.—Boise *Statesman*, Oct. 18: The Atlanta lode, which has produced over $3,000,000, and which was considered one of the richest mines in Idaho when work was suspended several years ago, has been sold to London capitalists. Every claim is secured by a United States patent, and the price paid is $600,000.

ROCKY BAR ITEMS.—Elmore *News*, Oct. 18: Everything is moving in good shape at the Ophir mine, and if Supt. Boyd is not restrained by his company he will in a short time astonish the natives with the Ophir output of gold. The Elmore new shaft is being extended down to the 600-foot notch in a rapid and satisfactory manner. E. C. Towne has recently been doing some development work on the John Boyle claim—one of the Jim Blaine group—and he is unearthing some very rich ore. The John Boyle is doubtless a continuation of the great Ophir lode.

MERITED FORTUNE.—Wood River *Times*, Oct. 23: Ore was struck in the shaft of the Camas No. 1 mine, last Friday, at a depth of 122 feet from the surface. This was somewhat unexpected, as the contract to sink was let with the intention, on the part of the management, to attain a depth of 125 feet and then drift for the vein. The ore is said to be similar in every respect to that found in the Camas No. 2. This being the case, it is evident that another bonanza has just been uncovered on the Gold Belt.

GOOD ORE.—Silver City *Avalanche*, Oct. 18: On the Midas lode, belonging to the Stoddard group at Wagontown, the quartz has been assayed and found to run upward of $50 per ton. The Manhattan Mining Co., Messrs. Davies & Howe, have encountered very rich ore in their mine and are taking out some fine nuggets of horn silver. This mine joins the Wilson on the northwest.

LOWER CALIFORNIA.

NEWS FROM ALAMO.—San Diego *Sun*, Oct. 20: Alamo continues to turn out gold. Four mills are hard at work and arrangements are being made to start up the El Paso Co.'s 10-stamp mill. The Santa Clara Co.'s mill will soon receive an addition of five stamps, as ore is being taken out of the Aurora faster than it can be milled. Night and day shifts are working since the pump was put in. The Manzanita Co. is rushed with orders for crushing custom ore. Several new rock-crushers have been ordered to keep up with the demand. The Princess mill is running day and night on the company's mines, principally the Ulysses and Indio. Probably the best strike ever made in the district was uncovered last week in the Ulysses. In drifting along the ledge on the 100-foot level, a new vein was encountered which joined the old vein at an acute angle. The point of junction was cut and the vein showed a width of five feet, every foot of which yielded quartz fairly bristling with gold. A contract for an air shaft 100 feet farther along was immediately let, and drifting was started alongside the new vein toward the shaft. The ore body held its size and richness the entire length.

AT REAL DEL CASTILLO.—San Diego *Union*, Oct. 18: The St. Nicholas mine at this place has been bonded by Manuel Gonzales. It had been idle since February, and a steam pump was set to work to get the water out and put it in shape for working. Saturday, A. Morales, the original owner, and J. M. Villagrano arrived from the peninsula and reported that they and the Ybarra Bros. of Ensenada had sold their interest in the property to Manuel Gonzales & Co. The debts against the mine have all been settled so far as Lower California is concerned, and ex-Gov. Ryerson, president of the outgoing company, will come to San Diego and settle all accounts held here against the mine.

MONTANA.

PROSPEROUS BUTTE.—*Inter-Mountain*, Oct. 22: The past week has been one of quiet prosperity among the mines of this district. Every smelter in the camp is running at its full capacity, there being no shortage of ore. The Princess Co. has received returns from a carload of ore recently shipped which makes the excellent showing of $72.80 in gold and $14.58 in silver. The stockholders are greatly elated.

VIRGINIA CITY DISTRICT.—*Madisonian*, Oct. 25: Work on the mines at the head of Meadow creek is being prosecuted with vigor, and they continue to improve with development. The Bedford Con. Mining Co., of which Mr. Joseph R. Muffly is the manager, is rapidly perfecting its plans for the erection of a smelter on its property and the vigorous working of the mines. Messrs. Elling & Morris are doing considerable preliminary tunnel work on their Pony mines preparatory to resuming active operations. The difficulties between the Pony Gold Mining Co. and its creditors have been settled, and there is no longer cause for delay in working these great properties.

IMPROVING.—Anaconda *Review*, Oct. 23: The last carload of ore shipped to Butte from the Silver Lake properties averaged 108 ounces to the ton, which is a very fine showing. At present the two big mines, the Anaconda and St. Lawrence, are beginning to touch upon their old-time prosperity. The Anaconda is raising ore from the 500, 600 and 700, there being an abundance of ore on these levels to last an unlimited time. All the levels in the Anaconda have again been placed in repair, and they now resemble their condition before the fire.

A SPOTTED BONANZA.—*Mining Review*, Oct. 22: A recent shot put in the Spotted Horse mine, at Maiden, is said to have thrown out specimens of ore that assayed $8000 in gold to the ton. Over 70 men are at work on the property, which not only shows up better than ever, but is constantly improving. The career of this mine is beginning to read like a romance. Each time after having to all appearances "petered" out, it has deluded the experts by bobbing up serenely with a greater store of treasure than ever.

NEW MEXICO.

LORDSBURG ITEMS.—*Western Liberal*, Oct. 17: Wednesday the Hercules mill was sold by Sheriff Whitehill. It was bought in by M. W. McGrath for the face of the judgment and costs, which amounted to $1388.19. Col. Marcus Huling, accompanied by his son Ward H. Huling, arrived in town Saturday night. The Colonel informs the *Liberal* that he has a large mill coming and that in a short time the affairs of the Standard Mutual Co. at Shakspeare will be on a boom.

OREGON.

MINERAL WEALTH OF JOSEPHINE COUNTY.—*Courier*, Oct. 25: Col. A. J. Straight expresses the opinion that there is enough ore in sight in Josephine county to justify the building of a road to Grant's Pass; and further than that, he considers this county one of the most promising fields on the Pacific Coast for experienced mineralogists, for he believes that not only gold and copper mines will be found in Josephine in abundance, but nearly all the other metals—silver, tin and nickel. He has also found excellent limestone, fine gravel and sandstone for building purposes. He added that if Colorado or Montana contained such unexplored fields of wealth they would make more noise about it than Chicago is doing over the World's Fair, and would get men of experience, men from all parts of the world. Thousands of dollars have been taken out of this county, but in the next 25 years there will be dollars where there have been cents.

UTAH.

THE CRESCENT MINE.—*Advertiser*, Oct. 19: At the annual meeting of the Crescent M. Co. the following facts were reported: During the year 3642 feet of drifts, crosscuts, raises and winzes were run, while the quantity of ground stoped amounted to 228,000 cubic feet.

THE MARY MINE.—The ore taken from the Mary mine at Bingham is free-milling carbonates. Hundreds of tons of low-grade ore have been thrown over the dump that will be well worth working as soon as a mill is put up for its reduction, which will likely be in the near future.

PROSPEROUS BINGHAM.—*Tribune*, Oct. 21: The Stewart tunnel, Bingham, is now in over 1400 feet, and at the heading there is much water and vein matter. This indicates that they are near the vein on the Saratoga and Washington for which they have been driving. They expect to start the Stewart mill early next month and keep it running.

ALL BUSY AND PROSPEROUS. — Everybody at Bingham is busy and doing well.

LEAD AND BROOKLYN. — Both the Lead and Brooklyn mines are doing nicely, and are sending out in first and second-class ores some 75 to 100 tons per day.

YOSEMITE NO. 2.—The Yosemite No. 2 is sending out an average of 300 tons of ore per month. The shaft lately reached a depth of 800 feet below the working level, and they are now cutting back to the vein, a distance of 20 feet, and will soon begin extracting ore from that end.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Oct. 30, 1890.

Notwithstanding the election engages attention of all, general trade is good. The buying does not appear to be confined to any particular locality.

The local money market is easy, although in some quarters it is said to be close. Remittances from the interior are free. Australia is sending us considerable gold for exchange purposes.

MEXICAN DOLLARS—The market is somewhat unsettled. The only buyers are Chinese. Large holders ask 84c to 85c, while some from outside sources (generally short sellers) are placed at a lower range.

SILVER—The Mint has not been in the market, having bought the last of the stipulated 4,500,000 ounces several days ago. Until the Mint is again in the market, which will be on next Monday, the quotations will be nominal. There is considerable silver held here for better prices. The market abroad and at the East has suffered from a well-organized bear raid. Large quantities held on a margin have been uncovered, and passed into stronger hands. Yet, even with the latter's buying, prices may go still lower on the next break. It looks as if the speculative pool has determined on bear raids until all large outside speculators are forced to sell, after which set in on a bull movement. The output of silver does not show any material gain, but on the contrary it looks as if there is a falling off on this coast.

QUICKSILVER—The market is steady at the lower prices. For quicksilver in bond, $52.50 is quoted. Receipts the past week aggregate 107 flasks, and exports, 156 flasks to Mexico.

LIME—Receipts the past week aggregate 5876 bbls. Notwithstanding the heavy receipts, all have gone into distribution. Clear weather is favoring sellers.

BORAX—Receipts the past week aggregate 758 ctls., and exports 21,046 lbs. to New York and 1180 lbs. to Mexico. The market rules firm at full prices. The East reports a strong market.

LEAD—Receipts the past week include 500 bars from Tacoma and 350 from Portland, Oregon. The market holds to strong prices. The opinion prevails that the market has, for the present, seen the top.

COPPER—The market holds to strong prices. The statistical position abroad continues to favor the holding interests. The *Iron Age's* cablegram from London reports on Oct. 22d as follows: "The disturbed condition of the stock markets has had a rather unfavorable bearing upon speculative operations in copper, but favorable statistics of movement and heavy consumption served to check the downward course of prices. The visible supply decreased about 1800 tons during the first half of the month, and receipts since then have been moderate. Sales of furnace material are difficult to make, however, as consumers' wants are well supplied by deliveries making on previous purchases."

TIN—Tin plates are stiff, but pig is only maintained by a strong corner. The consumption is light, but heavy consumption is expected in next year. London cables report tin plate strong with San Francisco still buying.

IRON—Foreign markets are rather mixed. Germany's is weak at lower prices, while the English market is feverish. The Eastern markets are easy with the tendency downward under free offerings at lower prices of good outside brands.

COAL—Imports the past week aggregate as follows: Departure Bay, 4516 tons; Seattle, 5013; Sydney, 1357; Comox, 2150, Nanaimo, 1300; Tacoma, 2850; Coos Bay, 700, total, 17,886 tons. The market is very strong for spot, under a continued good demand. The warm weather is against household coals, yet dealers say cold will come, when more of that grade will go into consumption. About one-third of the usual number of miners are at work in the Wellington collieries. Imports from these mines are coming to hand. From Australia reports are confirmed of the miners in one district going to work, while in the leading district they are still on a strike. Considerable English coal is on the way. Cars for bringing Cherry Valley and Rock Spring coals to this market will be obtainable soon.

San Francisco Metal Market.

WHOLESALE.
THURSDAY, October 30, 1890.

ANTIMONY	—	@	21½
BORAX—Refined, in carload lots	8	@	—
Powdered " "	8	@	—
Concentrated " "	7½	@	—
All grades jobbing at an advance.			
COPPER—			
Bolt	23	@	25
Sheathing	23	@	25
Ingot, jobbing	20	@	—
do, wholesale	18	@	18½
Fire Box Sheets	23	@	25
LEAD—Pig	6	@	6½
Bar	6½	@	6½
Sheet	7½	@	—
Pipe	7	@	—
Shot, discount 10% on 500 bags Drop, ℔ bag.	1 90	@	—
Buck, ℔ bag	2 10	@	—
Chilled, do	2 30	@	—
QUICKSILVER—By the flask	54 00	@	—
Flasks, new	—	@	—
Flasks, old	45	@	55
ORDOME IRON ORE, ℔ ton	10 00	@	—
STEEL—English, lb	16	@	20
Canton tool	9	@	9
Black Diamond tool	9	@	9
Pick and Hammer	8	@	10
Machinery	4	@	5
Toe Calk	4½	@	—
TINPLATE—B. V., steel grade, 14x20, to arrive.	—	@	—
B. V., steel grade, 14x20, spot	6 12½	@	6 25
Charcoal, 14x20	6 50	@	—
do roofing, 14x20	6 00	@	—
do, do, 20x28	13 00	@	—
Pig tin, spot, ℔ lb., nominal	23½	@	24
IRON—Bar, base	3	@	3½
Norway, base	4½	@	5½
	Spot.		To Load.
IRON—Glengarnock ton	34 00	@ —	30 @ —
Eglinton, ton	34 00	@ —	30 @ —
American Soft, No. 1, ton	— —	@32 00	30 @ —
Oregon Pig, ton	— —	@33 00	— @ —
Puget Sound	34 00	@ —	— @ —
Bar Iron (base price) ℔ lb	—	@ —	— @ —
Clay Lane White	— —	@28 00	26 @ —
Shotts, No. 1	34 00	@35 00	32½@ —
Langloan	34 00	@ —	30 @ —
Thorncliffe	34 00	@ —	30 @ —
Gartsherrie	34 00	@ —	30 @ —
Barrow	34 00	@ —	30 @ —
Thomas	33 00	@ —	— @ —
Cargofleet	30 00	@ —	26 @ —

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 21, 1890.

438,761.—CABLE GRIP—J. W. Gentry, Oakland, Cal.

438,808.—STENCILING BRUSH—J. I. Hansen, Portland, Or.

439,081.—SAFETY DEVICE FOR ELEVATORS—John Hatch, S. F.

439,067.—CHURN—W. J. Hersom, Stockton, Cal.

438,926.—SOLDERING MACHINE—M. Jensen, Astoria, Or.

439,072.—FRUIT-DIPPING APPARATUS—D. D. Jones, San Jose, Cal.

438,689.—STATION INDICATOR — J. Kueffer, S. F.

438,690.—SEWING MACHINE — M. Lachman, S. F.

438,752.—PIPE-COUPLING—E. Lawson, S. F.

439,082.—TOY TARGET—E. E. Lommatzsch, S. F.

439,183.—CHILO'S BEO LOUNGE—A. Morris, S. F.

439,084.—WINE-COOLER—A. S. Morton, Suisun, Cal.

439,085.—RAILWAY CAR—C. W. M. Smith, S. F.

438,649.—RAZOR-STROP—G. Spiess, S. F.

438,784.—TELEPHONE—J. C. H. Stut, S. F.

The following brief list by telegraph for Oct. 28, will appear more complete on receipt of mail advices:

California—Henry S. Brink, Biggs, cultivator; James B. Burrell, Wrights, machine for cutting boards; Elswood Chaffey, Santa Monica, mechanism for transmitting power; Leopold Dahlstrom, assignee of one-half to R. Menzel, Santa Clara, valve mechanism for double-acting pump; James C Gibson, S. F., clutch pulley; John J. Griffith, San Bernardino, burglar-alarm; Stephen C. Houghton, assignee of one-half to L. C. Branch, S. F., adjustable seat-back; Augustus A. Lamont, Santa Rosa, cuff-holder; Perham W. Rahl, S. F., navigable air ship; D. F. Oliver, Oakland, assignee to Hooker & Co., S. F., vehicle seat; James E. Pellow, Sierra City, leaf-turner; Daniel W. Williams, Fortuna, shingle-shaping machine.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Mining Share Market.

Mining shares the past week under review continued unsatisfactory for outside operators. The only relief from the monotony was a short-lived spurt in Andes, which failed to awaken other stocks from their drowsy condition. The foundation for the moves in Andes is hard to find out. Some say they are made on shorts, while others think they are based on promised developments later on. At any rate, the stock is active compared with others. A close and careful watching of the moves in the various stocks more than ever convinces the writer that they are being concentrated, and it is only a question of a short time when the market will go up, although before going up, they may shade off still more. This is the more apparent when the street has it "wait for a break, when buy." So far there has been no break, only "wasting away." The street is more mixed than ever, and is grasping at all kinds of wild rumors set afloat by either designing persons or by those who wish to see "what fools we mortals are." But they have the effect of frightening the timid operator, and nearly all outsiders are timid. In outside stocks the Quijotoas have been strong under the leadership of Silver King (the Silver King mine is in another district about 60 miles distant, but it goes with the Quijotoas). The Tuscaroras have been quiet but strong. The Bodies have flopped around in a mysterious manner. The general belief is that the Kelleys are trying to market their stock, and consequently the street fears to buy, even with the Bodie mill running and the very best advices from the mine coming to hand. Of course there are a few hulls, or at least they talk so.

Unquestionable information from the Comstock mines is confirmatory of very rich ore to the west in both the Ophir and Con. Virginia workings. This deposit is undoubtedly the downward continuation of the Red lode. There is apparently a quiet but determined three-cornered fight for control of the ore deposits. The Andes, West Con. Virginia and Con. Virginia are after it. Time alone will determine to which it belongs.

From the Comstock mines the news is of a very encouraging character for early results from the prospecting work being pushed in several of the mines. Much of the work is still of a secretive character, which in time will be made public through the usual skeleton letters from high-salaried superintendents. There can be no doubt but the "powers that be" are preparing a surprise for the public; like all their surprises, it will probably end in the garrulous public buying at high prices the now cheap stocks being bought by the inside. The official letter received yesterday from Crown Point notes more active prospecting work inaugurated and higher battery assays. In Seg. Belcher the work is becoming quite interesting, as it is in Belcher, Yellow Jacket, Confidence, Alpha and Con. Imperial. The decline in the Hale & Norcross and Savage stocks causes experienced miners to look with confidence for good results from the work going on in the two mines. The work under way in the middle and north end mines is being closely watched. After the State election next week, more news will probably be given from the mines.

From the outside mines the news from the Tuscaroras, Quijotoas and Candelaria mines is of a favorable character. From the Bodies our advices report more active prospecting in Bulwer. In Bodie the work begins to attract renewed interest from better informed miners. Some are looking for better results than have been had for many years past. The ore being milled is said to be high grade and all gold. The superintendent of the mine should conform to the law and report the number of tons of ore milled, the mine and battery assays, and more detailed information regarding the work in the mine.

The Bodie mill started up on Oct. 6th, and the first shipment of bullion was received to-day, amounting to $15,500. Other and larger shipments will follow every few days. The share market closed stronger and higher for the Comstocks.

MECHANICAL PROGRESS.

Band-Saw Mills.

The Vulcan Iron Works of this city recently shipped a hand-saw mill to the Elk River Lumber Co. of Eureka, Humboldt county, which is described by the *Pacific Lumberman* as follows: It has 8 foot wheels, and carries an 8 inch saw 50 feet long. In this style of mill the upper wheel is a spoke wheel, and the lower wheel is a web center or plate wheel, but in their other style the lower wheel is also a spoke wheel. The form and great strength of the main column and the front-supporting column of the upper-wheel shaft are such that there is no danger whatever of any vibration. The back-supporting column of upper-wheel shaft is guided by strong boxes securely bolted to main column. The bearings in which the shaft rests are trunnion hearings, and the back box has in addition side adjustments, by means of set screws placed at the end of the trunnion shaft, and also has a very convenient vertical adjustment.

The strain is first put on the saw by means of a simple method of worms and worm wheels, and is here taken up by the weights at the end of the long lever.

The bearings of the lower-wheel shaft are also trunnion hearings, and the back bearing has a very efficient vertical adjustment. These easy adjustments of the two-wheel shafts will be readily appreciated by any one that has ever run a band-saw mill, or who knows their necessity in being able to out good lumber. The upper-gnide arm is moved by means of a strong screw and connections, arranged for rapid and effective work.

There is no complicated mechanism around any part of the mill, and all parts are easy of access.

The Vulcan Iron Works are one of the leading manufacturers of saw-mill machinery, and the only manufacturers of hand-saw mills on the coast. They have made a study of the requirements of the work to be done here, and are building a hand-saw suited especially for the Pacific Coast. All parts are made unusually strong and heavy for the special work required, and no pains nor expense is spared to make it a complete machine for the purpose intended.

In Regard to Large Band-Saws.

Industry of this city in speaking of large band-saws says: This is a subject we take a special interest in and have had some experience with, so will say that the makers of band-sawing machinery have for 20 years past been inventing and improving the machines without any notable advancement, because the difficulties met with have not been in the machines at all, but in the saws. Almost any kind of a machine will operate a band-saw that is in proper order, and no kind of a machine will operate a saw that is not in such order. In the first place the teeth must be stiff and obtuse, also must be thin at the point and sharp. These two things are directly opposed, if we assume that thin, pointed teeth must be of the acute hook form, to attain a thin edge. This is not necessary. What the teeth want is an obtuse angle, very stiff, and a short hook point "swaged on" and spread at the same time to form the set. Machines are now made for this purpose and an experienced sawyer when he first sees a saw thus dressed, is convinced without an experiment even. The matter shows on its face that it is practicable and just what is required. Mr. L. O. Orton, of the Berry & Orton Co., at Philadelphia, has experimented a great deal with band-saws, and admits that his attempts to improve machines, while successful and useful, were directed to the wrong point in so far as securing good performance of the saws, and that the difficulties encountered have nearly all been traceable to the form and dress of the teeth, for log-saws especially.

We have examined the saws dressed on the system above described, also the machines for swaging, and are quite sure that with one of these almost any skilled man can "run a band-saw" in timber of any kind.

The most difficult wood to saw with a band-saw is the soft or spongy kinds. The hardness does not so much matter. Georgia or hard pine when seasoned saws very well with band-saws, because the dust is granular, to so call it, and does not pack in the kerf.

In Sacramento, Cal., is a large band-sawing machine for logs, built by Richards, London & Kelley of Philadelphia, for the C. P. R. R. Co., in 1872. The saws are 48 feet long, 5 to 6 inches wide, and the wheels six feet in diameter. This machine has been in successful use for 18 years past.

IMPROVEMENT IN SAND MOLDING PROCESSES.—A company is being started in Glasgow, Scotland, for the purpose of manufacturing improved sand-molding machines, as patented and already introduced, on a limited scale, by Mr. Laeder, foreman molder of the Singer Manufacturing Company's Works at Kilbowie. The invention in question not only accomplishes, without skilled artisans, the work of preparing molds, but while the first cost of the machine is extremely moderate, produces a complete mold in a single machine, and that at a speed not approached in any measure by the aid of skilled labor and such apparatus as has hitherto been available. By the employment of Mr. Laeder's invention, a great saving is effected through dispensing with the use of molding-boxes, the maintenance of which is a considerable item in the working expenses of a large foundry. Over 40 of the patented machines are at present in operation in the foundry of the Singer Manufacturing Company, and it has been found on the average that by their means the cost of producing molds for the castings has been reduced to about one-fourth of what had been formerly incurred, and that in an establishment where every appliance of value has been available for the ordinary process of molding. As the machine is adapted for almost any class of castings of which large numbers are required, it will, in all likelihood, be adopted by the majority of large foundries where light castings are produced.

ORIGIN AND MANUFACTURE OF THE AUGER.—Everybody is familiar with this commonplace but indispensable tool, though not perhaps with the story of its invention and the process of its manufacture. It is said that its principle was first discovered by accident. An Englishman, with the elegant name of Ben Pugh, in the year 1680, was idling away some spare time in watching a boy who was boring a hole in the ground with a piece of iron barrel hoop. As the pliable metal became heated, it twisted its edges and assumed the contour of a corkscrew, and as it was brought to the surface it brought the dirt with it, and combined the boring and emptying business so effectually that Mr. Pugh at once recognized its merit and applied the same principle in boring wood. It has been in use ever since. In the process of manufacture it requires some delicate manipulation and the service of a highly skilled artisan. The iron which forms the spiral part is welded with the steel of which the point is made before forging. It is then put under hammers and forged into shape and is passed into what is technically designated as a "wringing machine," where it is twisted into a spiral form and then introduced to the care of a series of "crimpers," which give uniformity to the twists. This done, the rough and unfinished tool is passed through "straighteners" and made perfectly straight and ready for putting on the head, which is the most delicate and important operation in the manufacture of the anger. The tool is then put through two rubber wheels to rough-polish the twist, when the fitter-up takes it in hand and fits the head and passes it on to the polisher, out of whose hands it passes into the market; and one of the most useful of modern tools preserves the reputation of Benjamin Pugh.—*Age of Steel.*

DELTA METAL.—An alloy of copper, zinc and a small quantity of iron is called delta metal. It possesses the properties of blacksmith's iron, is strong as steel, and of a golden-yellowish color. Toward acid and sea-water it is very resisting, and does not rust, nor does verdigris form on it. According to *Glaser's Annalen*, delta metal is a very old alloy, having been known to the old Egyptians. It was first prepared, however, in a scientific manner by Alexander Dick, a German, in 1882. This metal is an alloy of copper, iron and zinc, resembling aich-metal and sterro-metal, which contain the same elements and are largely used for heavy guns. The delta metal is prepared by taking advantage of the fact that melted zinc will dissolve about 9 per cent of its weight of iron. The saturation point of the zinc depends upon the temperature of the metals during the process—the higher the temperature the greater the amount of iron absorbed. At a white heat, nearly 20 per cent is taken up. The fluid alloy is then mixed with an amount of copper or copper and tin, which varies according to the purpose for which the metal is intended. The oxides present are removed by the addition of a small quantity of manganese, usually in the form of copper manganese alloy.

ENGLISH VS AMERICAN SHIPS.—The experience of the Pacific Mail Company in having its fast ocean steamer China built in Great Britain instead of the United States has not been such as will tend to create a rush to the Old World for vessels. The China made fast time across the Pacific ocean, it is true, beating the Oceanic a little, but she did it at such an expense as has caused no little dissatisfaction to her owners. She carries a few more passengers than the Peking, a 15 year-old American steamer, but the latter can carry about 800 tons more freight, which is quite an item in figuring up the profit and loss of a trip. While the City of Peking, with 4000 tons of freight on board and three boilers at work, makes slightly slower speed, she burns but 47 or 48 tons of coal daily. The China, with but 3000 tons and with a few more passengers than the Peking, burns 80 tons of coal a day and 120 when all six of her boilers are used. This comparison, it must be remembered, is made between a British-built ship whose construction had the advantage of all modern inventions and discoveries and a vessel built in Roach's yard 15 years ago.—*Daily Investigator.*

THE PRIZE ENGINE at the Royal Agricultural Society show of 1849, burned 11½ pounds of coal per horse power per hour; that of 1850, 7½; of 1852 4⅝; of 1853 4½; of 1855 3¾; of 1856, 3½; of 1872 2¾; and of 1887, 1 4 5 pounds per hour.—*Engineering, London.*

IRON BOLTS.—Iron bolts exposed to water, in the bridges over the Thames, have, in 25 years, been eaten away one-half.

SCIENTIFIC PROGRESS.

THE DEEP SEA IS FULL OF WONDERS.—There are fish living 2600 fathoms down, some blind, others almost eyeless, which are so compressed from the weight of the water that when brought to the surface their bodies expand. Three miles down there is no light and no change of temperature. Being no light, there is no vegetable growth, and the fish feed on each other—at least so many of them as have teeth probably do so. Those without teeth, no doubt, feed on animalcule. From Prof. Tait's experiments, it seems that at a depth of six miles the sea is compressed about 620 feet. May this compression long continue, for should it cease, something like 2,000,000 square miles would be inundated. In this connection, it is also interesting to notice that most fish have the habit, at the very first apprehension of danger, of darting rapidly away and of stopping equally quick. They seem to understand that a very few yards will get them beyond the vision of their enemy. The shading of the water varies from blue to greenish. Objects at a depth of 30 feet take a blue tinge, and at from 75 to 90 feet the light is such a deep blue that objects of a red shade appear black. When one returns quickly to the surface with his eyes accustomed to the peculiar under-water bluish light, the aerial landscape, following the laws of contrast of colors, seems reddish. The fact of the blue rays of light penetrating so much farther than those of any other color renders it possible to bring photography to aid the submarine explorer in his investigation as to the real depth that light does succeed in making its way.

A TELEPHONE TO THE SUN.—Mr. Edison is prosecuting an experiment by which he hopes to catch and record the sounds made in the sun's photosphere when solar spots are formed by eruptions beneath its surface. At Ogden, New Jersey, there is a mass of iron ore a mile long standing perpendicular, and extending into the bowels of the earth to great but unknown depths, said to contain several hundred million tons of magnetic material. As the violent storms and uprushes in the sun produce disturbance of the earth's magnetism which are recorded on the magnetometers at the Kew and other observatories, it has occurred to Mr. Edison that the strength of the solar disturbance, as exerted on our planet, could be increased enormously by utilizing a vein of magnetic iron ore, and running around the body of ore several miles of wire, forming an inductive circuit, into which powerful electric currents would be thrown by any disturbance of the earth's magnetism. By the use of instruments every change, he says, could be recorded, and by the use of the telephone all sounds produced on the sun would be heard on our planet. He is, accordingly, erecting telegraph poles on each side of the Ogden ore hill and parallel with it, on which he is coiling an insulated wire many times around the whole area where the earth's magnetic lines leave the iron mountain and extend into space. The two ends of the long wire will be taken into his observation station and connected with the receiving telephone. It is believed that these experiments will materially aid in determining variations of solar heat seriously affecting the earth's meteorology.

COAL DUST AND COLLIERY EXPLOSIONS.—The influence of coal dust in augmenting the force of colliery explosions and in extending the area affected by them is generally admitted to be very great. There are many miners, however, says a contemporary, whose experience and attainments are such as to entitle their opinions to consideration who hold that explosions never originate in an atmosphere composed of ordinary air and coal dust and that some percentage of explosive gas must always be present to start an explosion. Other competent engineers contend, and it seems to be established by the evidence of cases which have occurred, that explosions have originated and extended into other portions of the colliery from shots in stone drifts or tunnels where large quantities of dust were present, and where there was no gas. At all events the amount of dust in the roadways and working-places of a colliery is an element affecting safety which must be taken into consideration and guarded against. When dust and gas are both present, double precautions should be taken.

THE TONGUE AND TASTE.—It is said by medical experts that taste is not equally distributed over the surface of the tongue. There are three distinct regions or tracts, each of which has to perform its own special office or function. The tip of the tongue is concerned mainly with pungent and acid tastes; the middle portion is sensitive chiefly to sweets or bitters, while the back or lower portion confines itself entirely to the flavors of rich, fatty substances. This subdivision of faculties in the tongue makes each piece of food undergo three separate examinations, which must be successively passed before it is admitted into full participation in the human economy.

SIMPLIFYING EXPERIMENTAL SCIENCE.—The *American Engineer*, referring to Hopkins' "Experimental Science" in flattering terms, and naming the subjects treated under the 23 chapters which the work contains, concludes by saying: "Each of these chapters contains beautiful engravings of devices and apparatus, methods and means, that illustrate the instructions. Like the celebrated Faraday, the instruction is conveyed and the experiments described without recourse to mathematics. The majority of students have little taste for the intricacies of numbers and the higher formulæ of mathematics. Most of the apparatus illustrated and described can be constructed and used by any one having ordinary mechanical skill. The work bears the stamp of a thorough scientist, a writer who writes nothing but with certainty of action and result, and of a teacher who imparts scientific information in an attractive and fascinating manner."

THE IMMENSITY OF SPACE.—For a long period astronomers unsuccessfully endeavored, says *Nature*, to determine the distance between the stars and the earth, and it is only within a comparatively short time that the interesting problem can be said to have been solved. The distance which separates us from the nearest star is, according to a recent lecture by Prof. Nichols, about 206,000 times greater than the distance from the earth to the sun, or 95,000,000 of miles multiplied by 206,000. Alpha, in the constellation of the Centaur, is the star nearest the earth; its light occupies three whole years in traversing the distance which separates us from the little blinking orb; or, in other words, should Alpha be blotted out of existence today, we would be well into the summer of 1893 before the inhabitants of this mundane sphere would be aware that Alpha no longer existed. Yet light travels so rapidly as to occupy no perceptible space of time in flashing around our globe. If the sun were transported to the place occupied by this, the nearest star, the vast circular disk, which in morning rises majestically above the horizon, and in evening occupies a considerable time in descending entirely below the same line, would have dimensions puny in their insignificance. Colossal as the sun appears to us, it would, were it possible for it to exchange positions with Alpha, take the Lick telescope to make it appear as a star of the third magnitude.

"FACE PERCEPTION."—By some singular instinct a man who was born blind can tell when he is opposite an object, and can tell whether it is tall or short, slender or bulky. He can also determine whether it be a solitary object or a continuous fence; whether a close fence or an open one, and sometimes whether a wooden fence, a stone wall or a hedge. None of the five senses has anything to do with this perceptive power, but the impressions are made on the skin of the face, and by it transmitted to the brain. He therefore names this unrecognized sense "facial perception." The presence of fog interferes with facial perception, and makes the impressions faint and untrustworthy, but darkness is no impediment. A noise which distracts the attention interferes with the impressions. In passing along the street he can distinguish shops from private houses, doors from windows, and whether the windows consist of a number of panes or of a single sheet of glass.

OILING THE HURRICANES.—The ship Timandra recently arrived at New York from Calcutta after experiencing a series of most terrific hurricanes. She encountered no less than four during the passage. According to the N. Y. *Times*, she met the first July let near the Mozambique channel and lay in it 18 hours; the second was on the following evening and lasted 16 hours; the third, and worst, was July 24th, and lasted for eight hours; and the fourth came along July 31st, just off the Cape of Good Hope, and kept up for 32 hours. Capt. Mowatt, during this quartette of gales, hung oil bags over the bow, amidships and astern, and rode them all without injuring his vessel in the least. He is now enthusiastic over the oil idea.

A LOST COMET FOUND.—Some three weeks ago, Prof. Barnard of the Lick Observatory discovered what he at the time supposed was a new comet, which then occupied a space in the heavens near to the planet Mars. Since that time, computations have rendered it probable that it is the lost comet d'Arrest, which was last seen in 1877, and its return predicted in 1883. It did not then make its appearance, probably was overlooked, as it was only a telescopic comet. From computations of the two they now appear to be one and the same.

FIRE FROM STEAM PIPES.—In an article on the danger of fire from steam pipes in a German paper, it is said that after wood has remained a long time in contact with steam, hot water or hot air pipes, the surface becomes carbonized, and during warm weather the charcoal absorbs moisture. When the moisture is driven off, it leaves a vacuum into which the fresh-air current, circulating around the pipes, rapidly penetrates and imparts its oxygen to the charcoal, causing a gradual heating and eventually combustion.

THE NEW ALLOY, discovered by Keith of Birkenheim, Germany, is claimed to practically resist the attacks of most acids and alkaline solutions, and may therefore be very advantageously used in the laboratory to replace vessels of ebonite, vulcanite or porcelain. It is composed of 15 parts copper, 2.34 parts tin, 1.82 parts lead, and one part antimony.

IMPROVING THE PHONOGRAPH.—Mr. Edison has succeeded in improving the phonograph so that it can be worked by a water motor as well as electricity.

GOOD HEALTH.

a ı nd Cataracts.

EDITORS PRESS:—I have an idea; something I fr¤quently haven't got. I see in the newspapers that dreadest of all dread epidemics—the Asiatic Cholera—is heavy in the Islands of Japan, and that it may come in a ship to California one of these days,

Now in the trough, or valley, of the Ohio river is the City of Wheeling, and in that city I was born (so I've been told), and also, I was reared to some degree of manhood in that place, and as it is of pious record that I have been upon this earth for about threescore years, it stands to reason that I must have seen something of the cholera; for that disease has been in these United States several times since I came, and it about always strikes hard upon the line of the Ohio river.

When I was a boy the disease swept my native city furiously, and since then it has hit it pretty hard again and again, but at none of these times, or, as I think, at any time, has this disease prevailed in Zanesville, Ohio, 87 miles west of Wheeling on the Muskingum river, a branch of the Ohio.

During a heavy attack of the epidemic in Wheeling a vigorous young physician of Zanesville volunteered and went to Wheeling to study the great destroyer, and having soon died there of the disease, his body was taken to Zanesville and buried, but there were no cases succeeding his funeral. I have often, while I resided in Zanesville for ten years subsequent to 1852, wondered and pondered why there was none of this disease there when it struck Wheeling again during the fifties. The soil about the two cities is similar, the products the same, the surface hilly, the people's habits and housings alike, the fuel bituminous coal for both, the "breed" of the people from a like stock, morals, religion, education, and amusements nearly related; the trees, rocks and climate are not different. What then is it which preserves Zanesville from cholera and punishes Wheeling? The Ohio river moves "on its clear winding way toward the sea" with steady, even, strong current as it glides past Wheeling, leaving no stagnant water; while the Muskingum tumbles and whirls over rocks and rapids as it gurgles onward passing the whole length of Zanesville.

I have an idea that the rapids in the river at Zanesville have something to do with her exemption from the rapid disease. That the *microbes, bacilli, whoodle bugs or what-ye-may-call'ems* cannot stand the racket and the roar of pure, fresh water in large quantity. Large quantity, because the Muskingum is a stream larger than the San Joaquin, and, except in spring flood, its water is clear as a diamond. I have no knowledge of how the Asiatic terror acts, if at all, around Niagara Falls or other rapids of water, but the PRESS can inquire about this matter and find out, and perhaps it may be that rapid rolling waters are remedial or preventive when the cholera comes around.

I am about satisfied that water has a great deal to do, not only with cholera, but with several other epidemic diseases. Water of any kind is a dangerous fluid, anyhow. I've sampled it several times.

If we find that waterfalls are efficacious as against the invasion, we have only to "flee unto the mountains" up stream, and squat.

Let us all hope and the pious pray that the pestilent plague may keep away. In the mean time—yours, J. W. GALLY.

Pajaro Volley. Oct 22d.

ELECTRICAL TREATMENT.—The passage of a current of electricity through the body may benefit the system by agitating, and perhaps decomposing, certain portions of the tissue. A little electricity, however, goes a great way in this regard. Physicians, in giving this sort of treatment, use only from one to five one-thousandths of an ampere. From one to three amperes, passed through the vital parts of the human system, would be positively dangerous, for the tissues cannot stand so violent an agitation. In order to force this volume of electricity through one's system, a pressure of several hundreds of volts is necessary, owing to the resistance of the body.—*Ex.*

DISINFECTING CANDLES.—Of late, says the *Scientific American*, owing to its proved germicidic power, the vapor of bromine has come to the front as a disinfectant. Hygienic iodine lights and candles, which on burning liberate iodine vapor in any required quantity in the same manner as the bromine night lights liberate bromine, and which are made in a similar way, promise to render considerable service in the treatment of throat and chest complaints. They are, in fact, the first means introduced of successfully dispersing a gentle and regular flow of the vapor of iodine through the air of a room.

ANTI-PYRENE AND THE OPIUM HABIT.—One cause assigned by several physicians and druggists for the increasing number of victims to the opium habit is the use of anti-pyrene. A great number of young women, especially female clerks, take anti-pyrene in such quantities that it finally loses its restorative power. They then resort to morphine.

BACTERIA IN THE AIR.—A writer in *Science* says that while as yet we have discovered no way of avoiding contagion which comes to us in the air, we are just beginning to find out the extremely important fact that the air does not become contaminated with bacteria unless they are allowed to dry. Recent investigations, he adds, have shown a smaller number of bacteria in the air of a well-kept sewer than in that of a poorly ventilated schoolroom.

USEFUL INFORMATION.

HOW TO PILE HARDWOOD.—To know exactly how to pile hardwoods to secure quick results and prevent checks, stains and mold is more of a science, says the *Timberman*, than most people imagine. For instance, oak, ash, hickory and other tough woods must dry very slowly, and therefore when piled must be crossed with very thin sticks, placed closely together, in order to get it to dry as slowly as possible. The softwoods, like basswood, pine and poplar, dry more rapidly, and there is not so much danger of checking. No hardwood pile should be more than six or eight feet wide. The front part of the foundation should be at least two feet from the ground, the back about 18 inches. A space of at least two feet should be left between the piles. Begin the pile by leaving a space between each board, and continue to do so until the top is reached. Place the cross-sticks about four feet apart and directly over each other. Put the sap-boards with the sap down, and on the outside of the pile. Cross-sticks should never be more than three inches wide and thoroughly dry, and the front stick should be placed so as to project about an inch beyond the ends of the lumber. This allows just enough moisture to collect to prevent the stock drying too rapidly on the ends, or faster than other portions of the pile. When a pile is completed, the top should be covered in a substantial manner to protect the lumber from the rain and sun. This covering should project beyond each end of the pile and also over each side.

WHY DIAMONDS SPARKLE.—Many persons have been puzzled to account for the ceaseless motion of diamonds in the earrings worn by ladies. It makes no difference that the head of the wearer is in perfect repose and that she is speechless, the twinkling goes on, greatly enhancing the flashing beauty of the gem. The secret of this motion is in the setting of the diamond, and the method is patented. The patentee is rearing a royalty of $50 from every manufacturing jeweler to whom he sells the privilege of using it. The stone is set in the usual manner, except that a band like the handle of a diminutive basket is attached to the framework. On the other side of the band is a duplike cavity. On the lower part of the hoop is a pin, pointed with rhodium—a metal that never wears out—something like the iridium with which gold pens are tipped. When the diamonds are put into position on the hoop the rhodium point projects into the cup. The result is what scientists call a condition of unstable equilibrium. Like the pea blown with a pipe by a schoolboy, the diamond is given no rest, with the difference that no effort is required to keep it dancing.—*Jeweler's Weekly.*

A MACHINE FOR LAND CLEARING has been devised, which, without the expenditure of great force, accomplishes a vast amount of work in a short space of time, and with a degree of thoroughness hitherto unattained by mechanism for such a purpose, this being due to the peculiar construction of the device, which is in the form of a capstan. Around the drum of the capstan a heavy cable winds, the other end being attached by means of a heavy chain to the object to be removed. This cable is 160 feet in length and by means of a block of special adaptation, any part of it can be hitched, as desired. The shaft which turns the drum is 15 feet in length, and is drawn with entire ease by one horse. Dividing the length of the shaft by half the diameter of the drum, five inches, it gives the multiplying power of the machine as 36, and by means of another block the power of the machine is increased to 72 times that of the horse which turns the shaft.

TO PREVENT THE BREAKAGE OF MINING TIMBERS.—A German mining paper says that to prevent the premature breaking of the wall-props, the Consolidated Mining Co. in the district of Aachen has, after experimenting for some time, found that when three or four notches, 30 centimeters deep, have been sawed in the top part of the wood, this yields to the pressure by being compressed, but does not break. The economy in the item of timber has not yet found an expression in figures.

TO CLEAN IRON PARTS OF MACHINERY, tools, etc., two to three cents' worth of paraffine chipped fine are added to one liter petroleum in a stoppered bottle, and during two or three days from time to time shaken up until the paraffine is dissolved. To apply it, the mixture is well shaken, spread upon the metal to be cleaned by means of a woolen rag or brush, and on the following day rubbed off with a dry woolen rag.

JAPANESE PAPER.—Speaking of Japanese paper, the London *Daily News* says: Toughness and a silk-like surface are the usual characteristics of Japanese paper, which, in spite of our recent progress in this department of the arts, still remains far superior to European paper.

ELECTRICITY.

PROGRESS IN ELECTRICITY.—A noted astronomer once said that it was a moral impossibility for one man to keep abreast of the science of astronomy. Indeed, said he, individuals find enough to do in devoting their attention to one subject like Mars, the sun or the moon, and following it for a lifetime. The same truth certainly applies to physics, and more particularly to the subject of electricity. To say nothing about the purely scientific side of the question, no man can adequately study the advancement which is being made in the application of electricity to the mechanical arts. Not a week and hardly a day passes without some new invention to utilize this subtle power. Huge dynamos, new insulators, improved conductors, giant machinery and fairy-like contrivances, are some of the results which mechanical skill is constantly turning out in this steadily widening and fertile field of invention. And, indeed, the marvelous adaptation of this new agent to the practical ends of life even transcends the development of the steam engine. Nor will it be strange if the lightning does not make a greater revolution in mechanics than the tea-kettle did after that happy experiment of James Watt. Inventors are already feeling their way into the employment of electricity as a motive-power on a large scale, and it would appear that the world is at the threshold of some daring experiment, which shall eventually overturn existing ideas as to the limits of mechanical force.

ELECTRICITY IN THE PRINTING OFFICE.—A new use for electricity has been found at the Cook publishing house. In the office of the superintendent ten electric lamps are arranged in separate compartments of a frame or box, somewhat similar in appearance to the annunciators seen in hotel offices. The lamps are concealed from view, apertures in front of the compartments being covered with colored glass, each having its distinguishing color. The lamps are connected by means of electric wires with the automatic counting machines on the ten large printing presses located in an adjoining building. When the presses are in operation, the electric circuit is opened and closed by the working of the counting machines, causing quick flashes of light in the lamps. Thus every sheet of paper printed in the establishment telegraphs its record to the office, where the operation of each machine can be seen and its speed or delays noted. It is believed that this is the first application of electricity to purposes of this kind, and may serve as a valuable hint to managers of large establishments who wish to be enabled to see the operation of their machinery while working at their desks.—*Elgin, Ill., Daily News.*

ELECTRIC SAFETY DEVICES.—With our constantly increasing knowledge of the character and proper mode of handling electric wires, their danger is rapidly passing away. The great number of electric safety devices that are being brought out show that considerable attention is being given to the safety of circuits and apparatus, as well as securing the safety of the public. Automatic protectors for circuits and machines as well as lightning arresters are multiplying very rapidly. Ground detectors which automatically indicate a leakage from the circuits are in use and work most perfectly. In connection with these, means are employed by which the leak may be easily located. The successful working of all these devices has greatly increased the safety of high tension circuits, so that of late but few accidents have occurred. There is one underground circuit in Chicago carrying a potential of more than 4000 volts, and less trouble is experienced from this circuit than from some others carrying a potential less than half this amount.

GENERATION OF ELECTRICITY BY THE FLOW OF THE TIDE.—A French engineer, M. Decoeur, has elaborated a project by which he proposes to supply electric power to Paris. He would generate the required electricity by utilizing the flow of the ebb and flow on the coast and transmitting it to the French capital. There seems to be no reason why the scheme should not prove a practical one. If it should prove practical at the French capital at such a distance from the seacoast, it would be found much more practical in cities directly upon the coast. Why may not every such city be lighted by the tides, while incorporated companies are employing the same agent for the distribution of power? The wind and tides will ere long be pressed into the service of man in many ways.

ELECTRIC WELDING.—It would appear from the president's address at the late meeting of the British Association for the Advancement of Science that the principle of electric welding was publicly shown by Sir William Siemens, on a small scale, some years before the experiments of Prof. Elihu Thompson gave it its present world-wide reputation and value by his more thorough and practical demonstrations.

DEFECTIVE ELECTRICAL APPARATUS.—The New England Insurance Exchange employs an electric inspector whose duty it is to report to the secretary such electrical apparatus as he finds is not installed in accordance with the rules of the exchange. The secretary is also required to notify both the assured and the party installing the apparatus of all defects; and if, at the expiration of 30 days from such notice, such defects have been remedied, the rate on both building and contents will be advanced at least ten cents, and the new rates duly promulgated by the company's agent.

THE BUILDER.

About Fireproof Buildings.

Charles F. Andrews, a Boston architect, who has recently been visiting New York to study in that city the question of how to render city buildings better proof against fire than any plan now in use, says:

"We folks in Boston were led to believe that some of our builders had solved the secret of how to make buildings fireproof. At the last great fire in our city we learned how little confidence could be placed in these claims. Of course it is generally known that many of our streets are very narrow, and at the last conflagration the result of this narrowness was that structures on the opposite side of the street to that on which the flames were holding revel absolutely crumbled from the intense heat. Some of them were supposed to be fireproof buildings. The more I investigate the matter, the more confirmed becomes my belief that in the presence of a very hot fire nothing now built can stand. New York people had an illustration of the devouring power of fire in the case of the Western Union building. It was called a fireproof building, but when the flames took possession of it they had things almost all their own way. You have in New York a number of buildings that are calculated to present the maximum resistance to a fire started within them, but I doubt if they would stand before a general conflagration. After careful study on this important subject, I have come to the conclusion that the only safety to large buildings in case of fire can be found in the provision of water-tanks of ample size. I notice that in New York all the so called fireproof buildings that are in course of construction have immense reservoirs on almost every floor. In case a fire breaks out, the contents of these tanks may be let free and any conflagration drowned out. I do not believe we have yet solved the problem how to make buildings fireproof, but I have so much confidence in American ingenuity that I believe it is only a matter of time when we shall learn how to erect structures that will be able to defy any conflagration, however hot it may be."

There seems to be a pretty general agreement in the opinion that a genuine fireproof building is something which has not yet been devised, but still the possibility is considered within the skill of our architects, the only hindrance to its realization being the prevailing vice of American life—the haste to get rich and the grudging of a little money to provide against some possibly remote contingency.

ESTHETICS IN HOUSE FINISHING.—More thought, says the *Architect*, has been given at different periods of civilization to the obtaining of esthetic effects for the interior of residences than, perhaps, any other matter in the history and evolution of architecture, and in our sunny California it is interesting to note the growth of refined taste to which so many of our architects are now called upon to cater. Our State, we consider, is as remarkable for its architectural growth as it is for the enterprise and liberality of our many millionaires. It is suggestive to the ambitious designer, that here in the far West, the elegant portiere has within a decade or so supplanted the miner's gunny-sack which once draped the openings of his mountain castle, and that the elegant "modern residence" of the Queen Anne, or other type, has taken the place of the "candle-box" style which was once the pride of the "contracting architect, shingler and builder" who furnished "plans," etc., for *glory*, and made the rattle-trap thing cost in extras and repairs twice the amount of his original contract. It is encouraging to note architectural advancement made in residences and business structures in both city and country, and also a real growing demand for the many modern features which go to make the American home beautiful—"a joy forever."

CALIFORNIA VENEERS.—California and the Pacific Coast is noted throughout the world for its wonderful productions, and not the least of these are the ornamental woods suitable for the most delicate effects of the artistic designer in fancy woods, wherever he may be found, whether in the countries of the New or Old World. Their beauty is appreciable by all; from the savage to the most cultivated esthetic taste, their rich tones and ever-changing shades cannot fail to bring exclamations of approval. If the wonderful Aladdin was now to build his palace, the expert sprites would certainly procure their fancy woods from this part of the world. The *California Architect*, from which paper we clip the above, very properly adds: In view of the above, it seems astonishing that Eastern architects, designers and manufacturers of artistic woodwork should be so slow to look into the adaptability and beauty of our Pacific Coast woods.

RESISTANCE OF BRICK.—Recent experiments to test the strength of brick resulted in demonstrating a crushing resistance of from 5000 to 20,000 pounds per square inch, according to the quality of the brick.

MINING AND SCIENTIFIC PRESS

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Mining Machinery—H. P. Gregory & Co.
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☞ *See Advertising Columns.*

Passing Events.

The balcyon days continue on the Pacific Coast and ont over the great South Sea that softly laves the shores of this far Southwest, the weather here being in sharp contrast with that which obtains on the Atlantic side of the continent, where the destructive tornado sweeps alike the land and the ocean. This California climate of ours should seem to the whole world a standing invitation to come here and enjoy safety and peace.

The labor troubles, that little distnrb here, continue and spread among peoples abroad. They encircle the world. In Australia, British Columbia and Canada, all over the Eastern States; in Great Britain, France, Belgium and Germany, the laborer and the employer stand arrayed against each other to the great detriment of both. A dark winter impends, admonishing a settlement of the difficulties that so distract the industrial world.

Mining for the precious metals is being well prospered throughout the Pacific States and Territories, Mexico and British Columbia included. In Australia, however, the industry is being much crippled through labor strikes, which affect every branch of the business, gold, copper and coal-mining alike. Operations in even the great Broken Hills mine have, through this cause, been brought to a standstill. This alone implies a loss of more than half a million per month, a large percentage of which falls on the wage-earner. This obstruction of the mining industry will materially reduce the output of gold, coal and copper in that country this year.

The difficulties that for a time beset the Commissioners of the Columbian Fair having been disposed of, the enterprise seems to be sailing in smoother waters, though a new trouble appears to menace its success in the threatened refusal of Italy and other European nations to be represented at the great exposition because of the enactment of our late tariff law. The better way, it strikes us, would be for the parties aggrieved to retaliate in kind.

The potato blight that has fallen on large sections of Ireland seems likely to be supplemented by an unusually short crop in this country as well. Murders, assassinations and suicides grow apace, filling the mind of the humanitarian with apprehensions as to the future of the race. As regards the frantic exhibitions of patriotism incident to the political canvass now in progress, these philanthropists are not so deeply distressed, seeing in the results of the impending election a cure for the malady.

A Great Convocation of Workers, Thinkers and Inventors.

Mr. Charles G. Yale, associate editor of this paper, who took his departure East on the 28th Sept. with the purpose of meeting in conference the various bodies, British, German and American, interested in the manufacture of iron and steel, and of visiting later on the great coal, iron and petroleum districts of Pennsylvania and regions adjacent, writes us giving a detailed account of his experiences since leaving California. We can at this time give no more than a synopsis of what our associate has to say in the above connection, and a more full account of which will hereafter appear in the columns of the PRESS.

The party of home and foreign engineers, which alone consisted of 600 persons, left New York on the 11th instant by two special trains over the Pennsylvania railroad. Reaching Philadelphia, this party visited first most of the great industrial establishments in and about that city. Then the Edgemoor Iron Works, 30 miles below on the Delaware, were seen. Next the Schuylkill valley, with its coal and iron, and its more notable manufacturing centers, was visited. This accomplished, the party having meantime been joined by the representatives of the Ironmasters of England, Germany and the United States, the vast concourse moved west, taking in the Johnstown district, the site of the late disastrous floods, also the Monongahela and other oil-producing sections, reaching finally the smoke-begrimed city of Pittsburg, with its forges, furnaces and foundries, its machine-shops and factories, infinite in variety and vast in extent.

Among the guests present were most of the iron magnates of our own and other countries. Conspicuous among the number were Sir Lowthian Bell, Sir James Kitson and Sir Nathaniel Barnaby, Englishmen; also Herr Alex. Thielen, president of the German Iron Verein, together with our own Andrew Carnegie, Abram S. Hewitt, John H. Ricketson, Rossiter W. Raymond, George W. Maynard and many other untitled noblemen, citizens of these United States. Never before was there gathered anywhere, or on any occasion, so much science, skill, and practical talent, as at this great convocation of workers, thinkers and inventors; nor can we hope soon to see another such gathering either here or elsewhere.

A Voice from the Mountains.

At the Joint Assembly Convention held at Sierraville on the 29th ult., it was determined that the Boards of Supervisors ought to be empowered to impose a license tax on sheep brought in to graze in the mountain counties; it was also expressed, as the sense of the meeting, that the hydraulic mines in Sierra and Plumas counties, being distant some 200 miles from Marysville, the amount of debris carried down that far could cause no appreciable damage to the farming lands or to any other interest; wherefore, the continued suppression of that industry in these counties ought to be deemed unjust and inexpedient. It is expected that Mr. F. G. Hail, nominee for the Assembly from that district, will, if elected, exert himself to carry out the views of the convention as above set forth.

The New Phase of Suicide.

Whence Comes It and What Does It Tend To?

Cyrus W. Field, the New York millionaire, having erected in that city a very tall building, one of his sons going to the top and passing out on a platform protected only by a railing, was seized with a sudden impulse to jump over, and would have done so had not a person present grasped him by the arm and prevented his taking the fatal leap.

This tendency to commit suicide under the influence of a momentary impulse, though not always under circumstances precisely like those above related, is becoming alarmingly prevalent, more especially in this country. With some, the rushing by of a locomotive becomes the incentive to self-destruction. Others cannot trust themselves to look over the side of a steamer, to such an extent does the sight of the water incite in them a desire to jump overboard, while still another class when climbing a high ladder or clinging to a rope are actuated by an irresistible impulse to let go their hold.

And this proneness to self-immolation is clearly on the increase. Indeed, it would appear to be of comparatively recent origin, there being little or no evidence of its existence in former times. As yet neither our doctors, our psychologists nor our clergy have been able to explain whence it comes or to divine what it means. That it is the product of our modern civilization there is good reason to believe, since among less enlightened peoples it does not much obtain.

True, suicide, pure and simple, is practiced everywhere. But its victims are moved thereto by causes and motives that are easily defined and well understood. Not so, however, with this new mental malady, which, coming without warning or any known cause, proves a stumbling-block to those whose business it is to minister to the mind diseased.

In searching after the origin of this inscrutable soul-sickness, it may be well to look a little below the surface. Excessive culture, as we all know, is a prolific breeder of disease. The wild-grape vine, unpruned and uncared for, has a long and healthful life, whereas the cultivated vine is short-lived and sickly, the same being measurably true of all other cultivated fruits. Is it much different with the human race? The uncultured savage has few comforts and no luxuries. He is ignorant of the many pleasures enjoyed by civilized man; but then he knows just as little of the social evils and the mental disorders with which the latter is afflicted, leaving it a question which is the better off.

Should this new madness much increase, as the vices and the infirmities of a high civilization are apt to do, it will be calculated to incite the gravest apprehensions. If it has come to stay and to spread, the fact becomes fearfully suggestive. This style of self-murder, as before observed, is becoming every year more and more common. The number of these crimes, or casualties, if the reader so prefer to call them, has, during the present generation, been more than doubled. The fool-killer having been off his beat for a very long time, the mentally unsound have multiplied at an alarming rate, and if for this hallucination there shall be found no cure, we may expect that it will hereafter take on still other forms, developing, perhaps, phases yet unheard of. That its manifestations will be confined to cases of the kind we have enumerated is too much to hope for. That the spell will come over these unfortunates on other occasions and under other circumstances than those before mentioned may well be supposed. There is room for this malady to expand in various directions—in the direction of the knife and the pistol; also, of the deadly potion, which latter having been attained to "rough on rats," may no longer be left standing around carelessly.

There is, in fact, a chance that this practice of self-immolation will yet grow into a fashionable pastime—possibly an uncontrollable craze. The day may come when the rich and the aristocratic, the over-cultured and the aesthetic, will consider this the proper thing to do; when we shall find of a morning the courtly lady standing on her head in a tub of cold water, the attenuated legs awry and the nether garments reversed in an unseemly manner; when the deeply-read cook will seek to roast her person by crawling into an over-heated oven or by seating herself on a red-hot stove; when, through this jumping-off process, the bodies of the distraught shall accumulate in heaps about the tall buildings, with some increment, of course, during *leap* years and, finally, when the average policeman, worrying over the low state of religion, shall club himself to death and the dude strut his life out under the impression that he is a turkey gobbler.

The time may come, we say, when the victims of this false and forced civilization of ours, aweary of life, will have recourse to these and possibly other expedients for getting rid of it. The contingency is not a pleasant one to contemplate, though it must be confessed there is a glimmer of sense in one so demented, seeking to butt or blow out his brains; and who shall say that this mysterious and inexplicable madness, which so subverts the first law of Nature, is not the beginning of the end? When the instinct of self-preservation shall come to be largely extinguished, the time will be not far off when the experimenter with man on this planet will feel constrained to pronounce that experiment a failure.

Only What Was Expected.

The price of silver in this country has, during the past month, declined 25 per cent, caused by overspeculation in this metal and by a determined effort on the part of the monometallists to frustrate the measures taken by Congress looking to the partial rehabilitation of silver. This is no more than was expected. The failure of this effort to disparage the white metal shows, however, the futility of attempts of this kind, nor is it probable that the speculators, after the experience they have had, will care to again load up with silver in the hope that they will be able to corner the market. To make impossible speculations of this kind and put an end to this war on the white metal, all that is required is to admit it to free coinage, after which it will take care of itself. As long as it remains, as at present, even partially ostracised, we shall experience more or less trouble in our attempts to adapt silver to the ever-fluctuating conditions of the financial and commercial work. Let its ancient functions be restored and thus an end be put to all this pother about silver.

The speculative movement in silver inaugurated in this country having inspired a general belief that it would advance the price of that metal to extreme figures, large shipments were made, arriving here from every quarter. These hopes failing to materialize, the price of the commodity naturally tumbled in the manner we have seen and to the serious loss of those interested in maintaining inflated figures. This decline was not due to any overproduction of silver such as its enemies predicted would follow the late legislation in its favor, nor is it likely that any such overproduction will take place.

The Director of the Mint, who enjoys exceptionally good opportunities for studying this question and forming a correct judgment in regard to it, expresses the opinion that no such result need be apprehended, for the reason that there has occurred of late no appreciable increment in the output of our silver mines, though the enactment of the late congressional bill has tended to stimulate that industry. If new ore deposits are being discovered and the mines are being worked a little more vigorously, the old deposits are being exhausted, while the winter season, now at hand, will tend to diminish production.

Even though the product of silver should be considerably enlarged, it will no more than keep pace with the growth of our other industries, which, being extremely rapid, call for a corresponding increase in the circulating medium. The expansion of silver mining in other countries, so confidently expected, has not taken place. Mexico has silver mines, but the output remains as before, the same being true of South America, Australia and Russia, in which last-named country the product of the white metal is comparatively small, though it is known to contain extensive deposits of lead-silver ore. But this ore is generally low-grade, these deposits being in other respects unfavorably conditioned for large and profitable production. An excessive output of silver is not therefore to be apprehended.

Salt-Making Processes.

NUMBER III. - CONCLUDED.

The Kanawha or Pomeroy Method.

Although this process has been in operation for some 40 years, it has so much to recommend it, and the evaporative power of the fuel is so fully realized, that it has seemed advisable to give some account of it; for in principle it is available not only in salt-making, but also in other branches of chemical manufacture where the economical evaporation of large amounts of dilute solutions, together with fractional crystallization, is a desideratum.

For the description and the data from which the accompanying plan has been made (Fig. 3) Mr. Chatard is indebted to Mr. John J. Juhler of Pomeroy, Ohio. The dimensions and details of operation are taken from his White Rock Furnace, and represent typical works carefully run and giving results stated by other manufacturers to be among the very best.

The characteristics of what may be called the Ohio region are cheap fuel and weak brines which, though very impure, are nevertheless practically free from gypsum. The principle of the method is the boiling of the brine in a steam chest by which a portion of the impurities is rendered insoluble, and a large supply of low-pressure steam is utilized in the evaporation of the brine. The grainers are arranged at different levels so that the mother liquors can be drawn from one to the other, giving a series of products of which the early ones are ready for the market, the later being redissolved in the settlers. The process is thus practically a continuous one.

The brine is pumped into a large tank and flows through a trough in which it is heated by steam pipes and conveyed to the front of the furnace, where it enters the first division of the steam chest. The steam chest in which the brine is boiled is in three divisions, connected by copper pipe. Each division has a cast-iron bottom one inch thick, made by placing together side by side 11 pans, each 10 feet long and 3 feet wide, having ends 12 inches deep and sides 8 inches deep, except the two end pans, which have each one side (the end side) 12 inches deep. By bolting these pans together we have a single pan 33 feet long, 10 feet wide and 12 inches deep, having divisions 8 inches high running across it every 3 feet. The seams of the divisions are thoroughly calked.

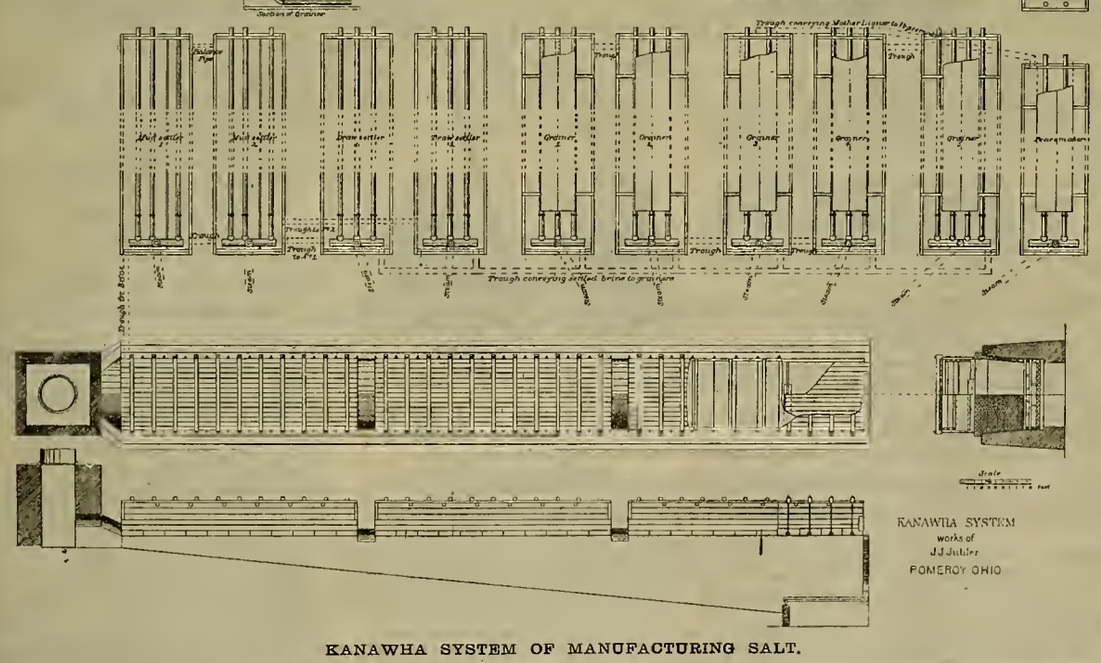
Resting on the divisions and bolted to the inside of the side-plates is the side-planking, 4 inches thick and 4 feet high, the seams being horizontal. The ends of the steam chest are formed by bolting to the outside of each of the end sides of the pan the so-called "damper," a cast-iron plate 1 inch thick and 2 feet high, having sides which extend back about 8 inches on the outside of side-planking; the remaining portion of the ends is filled out with 4-inch planking bolted to the inside of upper edge of damper and grooved into the ends of side-planking. Across the top of the tank so formed are six iron joists, let in flush with the upper edge, on which the top planks, also 4 inches thick, are laid.

In the steam-chest the brine is boiled till it reaches 15° to 18° B., depending upon the needs of the grainers for brine, the steam pressure carried being about four pounds. The brine, deeply colored by suspended oxide of iron, is then drawn off and flows into the first mud settler, reaching it on the upper side of the water-tight central partition; passes to the farther end, then through a low place cut in the top of the partition back to the head of the settler, whence it goes to the second mud settler to make the same round. By this time the iron mud is deposited and the brine, already much concentrated, flows to the first or the second "draw settler," as needed, where it concentrates until ready to deposit salt, unless the grainers require it before it reaches that point, which is 23° B. (sp. gr. 1.178). From the draw settlers it goes to grainers 1 and 5, where it deposits the best salt. When the brine in No. 1 attains 24° to 25° B., it is drawn into No. 2, while that in No. 5 reaches 26° to 27° B., and then goes to No. 4. Nos. 2 and 4 give a quality of salt but little inferior to that of Nos. 1 and 5.

The mother liquor of No. 2 and No. 4 goes at 29° B. to No. 3, where, still depositing salt, though of an inferior kind (No. 2), it reaches 31° B., when it is drawn into the "peacemaker" or smaller grainer, where it concentrates to 34° to 35° B., being then transferred to a "bitter water cistern" and rising to 37° B. In each of these some salt is deposited; but it is so impure that it is redissolved in the first mud settler. The heavy mother liquor is now ready for the bromine works, where it is distilled with sulphuric acid and chlorate of potash, yielding, when properly managed, about one pound of bromine for every two barrels of salt made.

The residue of the bromine distillation is then neutralized with lime and evaporated. It deposits some agricultural salt, and the hot liquid, consisting mainly of chlorides of calcium and magnesium, is run into oil barrels, solidifies on cooling, and is sold, being employed for making the non-freezing liquid of the Pictet ice-making process.

The settlers and grainers, with the exception of the "peacemaker," are each 180 feet long and made of 4-inch lumber, pine or poplar, preferably the latter. The steam connections are all of wood, being made of pine or poplar logs with a 6 inch bore, the copper pipes being five inches in diameter, 3 16 of an inch thick, connected by gooseknecks to the headlogs at upper end of grainers and passing through the lower end. The condensed water runs to waste, experience having shown that no further benefit can be derived from the small amount of heat thus lost. The absence of sulphate of lime, one of the most important points connected with this brine, permits the use of the light copper pipe, to which, in great measure, the high evaporative result is due.

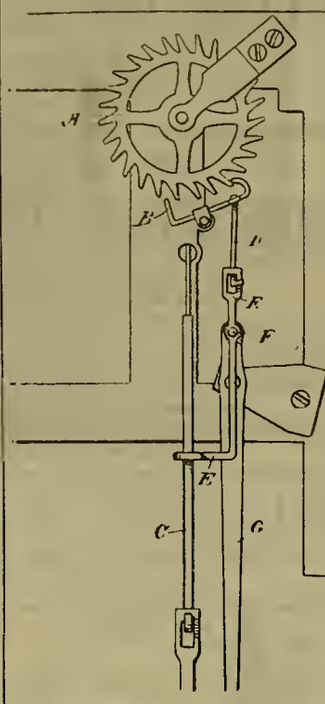


KANAWHA SYSTEM OF MANUFACTURING SALT.

Verge-Wire for Clocks.

The accompanying cut illustrates the invention of James M. Miller of Vacaville, Cal., which he has secured by letters patent of the U. S., No. 438,355, dated Oct. 14, 1890.

Every one knows how essential it is to have



VERGE-WIRE FOR CLOCKS.

a clock in even heat. A clock may be properly adjusted in this respect when it leaves the dealer's, but if the owner in mounting it does not get it on a level shelf, it will be out of beat, and the consequence will be that the verge will fail to properly engage the escape-wheel and the clock will soon stop.

While it is an easy matter for a clock-maker or repairer to readjust the verge to suit any given location of the clock, it is not easy for the owner to do so, even though he knows enough to bend the verge-wire. The invention of Mr. Miller, however, provides a very simple and readily operative means for enabling any one to properly adjust his clock to an even beat no matter whether it be on a level shelf or not. This device will be readily understood from the cut. The usual parts of the clock are the escape-wheel *A*, verge *B* and pendulum wire *C*.

The customary verge-wire consists of a single piece attached at its top to the verge, and bending about the pendulum wire at its lower end. Now any adjustment of this wire will adjust the verge, and the usual adjustment is effected by bending the wire; but this is a somewhat difficult operation for an inexperienced person, as he can get it to the proper point only after repeated trials. In Mr. Miller's invention, the verge-wire is divided into two sections, the upper one *D*, and the lower one *E*. The former is connected with the verge, and the latter with the pendulum wire, and the two are jointed together at their adjacent ends. The lower one near its top is pivoted at the point *F* to the upper end of a pivoted lever *G*, the lower end of which extends downwardly within easy reach. Now when the clock is out of beat, by turning the lever to one side or the other, as may be needed, and thereby shifting the fulcrum *F* of the verge-wire, the sections of said wire are slightly changed in position and made to conform to the position and throw of the pendulum wire, while keeping the verge itself in proper position to be operated by the escape-wheel.

African Gold-Fields.

In a paper read before the American Institute of Mining Engineers by W. H. Furlonge of Johannesburg, "On the Geology of the De Kaap Transvaal Gold-Fields," he says that here, as in other gold-mining countries, are found large granitic areas and belts, flanked by schistose and shaly rocks, which contain auriferous quartz veins. Decayed granite also often covers immense tracts. The town of Barberton is built on the eastern edge of one of them, which is at least 16 by 18 miles in extent. A striking feature throughout the large areas is what are locally known as "dongas." They are merely water-washes in the decomposed rock, are often of great extent and depth (the latter reaching 200 feet), and sometimes present the most fantastic and picturesque appearances. The accompanying engraving is given of one of the more striking. The rock seen is entirely decayed granite, which is on a "flat" and in a natural drainage channel; while the hills in the background are composed of the same rock, but in a normal or solid condition. The fragments that have rolled down the hill on to the "flat," and which have been subjected only to the ordinary atmospheric action, are also undecayed.

The Mechanics' Institute Fair.

The annual fair of the Mechanics' Institute, which closed one week ago to-day, though well attended, was not quite so successful in a financial point of view as that of last year, the net profits realized this year having amounted to $25,000 against $30,000 the preceding year. But despite this falling off in net revenue, the late exhibition was in all respects equal if not superior to any of its predecessors, nor was it less appreciated by the multitudes who attended it. The premiums awarded were numerous, and, as a rule, gave general satisfaction, as has usually been the case.

In the department of mining machinery several notable improvements were on exhibition, also some highly useful inventions in other provinces of industry. The display was rich in electric apparatus and appliances, denoting the intense interest with which everything pertaining to this new agent for the generation of light and the transmission of power is regarded by all classes of the community, the common mind being profoundly impressed with its possibilities. Next year it may be expected that more that is new and startling will find a place in the fair, these annual expositions showing the advances made year by year into the domain of this strange and subtle power.

Alexander Keller of Auburn had on exhibition a very creditable collection of mineral specimens, the most of them obtained in Placer, Nevada and El Dorado counties. There were in this collection over 100 samples of building stone, the most of them being of different varieties, showing how rich the above section of California is in material of this kind. The State Mining Bureau was represented by specimens of the useful metals and minerals, such as asbestus, chrome, cobre, manganese, etc., also by sections of the "Big Trees"—about the largest ever gotten out from these giants of the forest.

For the entertainment and instruction they afford the masses, these fairs are deserving of every encouragement, being worth always a great deal more than they cost.

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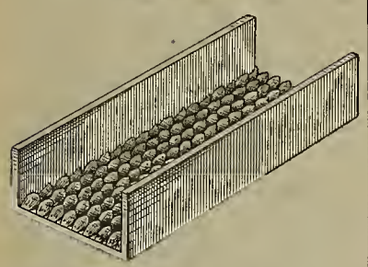

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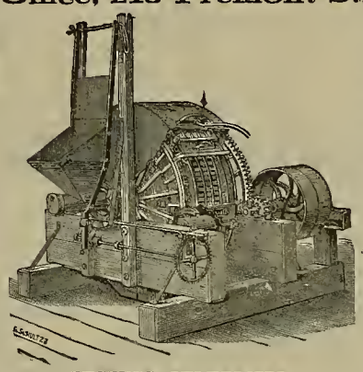

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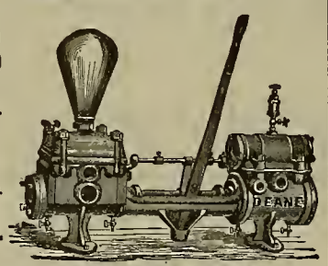

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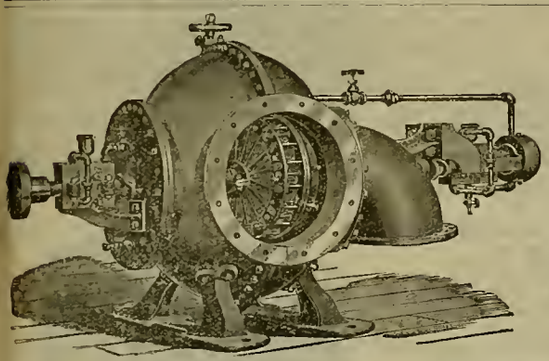

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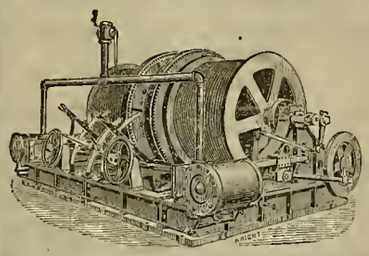

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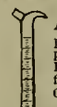

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ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alpha Cons M Co	Nevada	5	25	Sept 16	Oct 22	Nov 11	C E Elliott, 309 Montgomery St
Baker Divide & M Co	California	18	20		Nov 17	Dec 8	D M Kent, 330 Pine St
Challenge Con M Co	Nevada	7	50	Sept 26	Oct 28	Nov 17	C L McCoy, 331 Pine St
Con Imperial M Co	Nevada	29	5	Oct 15	Nov 15	Dec 3	C L McCoy, 331 Pine St
Goleta M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
Gray Eagle M Co	California	20	6	Oct 20	Nov 24	Dec 15	J M Buffington, 303 California St
Gould & Curry S M Co	Nevada	65	30	Sept 16	Oct 21	Nov 13	A K Durhrow, 309 Montgomery St
Hale & Norcross M Co	Nevada	95	50	Oct 7	Nov 12	Dec 3	A B Thompson, 309 Montgomery St
Leigh G evel M Co	California	1	25	Sept 3	Oct 13	Nov 5	E E Fall, 320 Pine St
Mexicen G & S M Co	Nevada	41	25	Oct 18	Nov 20	Dec 10	C E Elliott, 309 Montgomery St
Mono G M Co	California	30	25	Sept 18	Oct 23	Dec 2	B L Burling, 309 Montgomery St
Montecito M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
North Peer G & S M Co	Arizona	5	5	Oct 1	Nov 5	Nov 25	Henry Deas, 309 Montgomery St
Russell Reduction and M Co	California	7	5		Nov 17	Dec 8	J Morizio, 328 Montgomery St
Sterling M Co	California	1	6	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
Seg Belcher & Mides Cons Co	Nevada	7	25	Oct 7	Nov 10	Dec 1	E H Holmes, 309 Montgomery St
Silver Hill M Co	Nevada	27	20	Oct 3	Nov 13	Dec 3	D C Bates, 309 Montgomery St
Silver King M Co	Arizona	4	30	Sept 20	Oct 28	Nov 18	Aug. Waterman, 325 Montgomery St
Trinity River T & M Co	California	3	30	Oct 6	Nov 17	Dec 8	Edwin L Griffith, 28 California St
Weldon M Co	Arizona	3	10	Sept 3	Oct 9	Oct 30	A Waterman, 309 Montgomery St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Great Western Quicksilver M Co	Cal.	A Halsey	328 Montgomery St	Annual	Nov 5
Mineral King M & M Co		J F Norman	419 California St	Annual	Nov 3

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 9.		WEEK ENDING Oct. 16.		WEEK ENDING Oct. 23.		WEEK ENDING Oct. 30.	
Alpha	1.50	1.75	1.55	1.80	1.50	1.75	1.80	2.15
Alta	1.55	1.70	1.55	1.65	1.35	1.45	1.40	1.55
Andes	2.25	2.65	2.30	2.80	2.05	2.35	2.00	2.45
Belcher	3.15	3.40	3.25	3.35	3.05	3.10	2.75	3.10
Best & Belcher	3.60	3.85	3.60	3.85	3.30	3.40	3.35	3.60
Bullion	2.75	3.70	3.40	3.75	3 10	3.55	3.05	3.20
Bodie Con	1.45	1.65	1.70	1.95	1.80	3 00	2.25	2.55
Bulwer	.25	....	.25	.35	.25	.55	.45	.65
Commonwealth	2.75	....	....	....	2.00	....	2.60	....
Con. Va. & Cal	4.75	4.90	4.75	4.85	4.15	4.70	4.40	4.75
Challenge	2.50	2.90	2.65	2.75	2.00	2.8.	2.30	*3.00
Choller	3.15	3.75	3.45	3.75	3 15	3.50	3.15	3.40
Confidence	7.00	7.75	7.50	....	7.00	....	7.00	....
Con. Imperial	.40	.45	.35	.45	.35	....	.35	....
Caledonia	.55	.60	.55	.60	.45	.50	.45	.50
Crown Point	2.70	2.90	2.80	3.00	2.75	2.95	2.60	2.90
Crocker	.30	....	.30	....	.25	.30	.35	.40
Del Monte	.80	....	.75	....	....	....	.80	....
Eureka Con	4.25	....	4.20	4.25	4.00	....	3.80	4.00
Exchequer	1.15	1.50	1.40	1.60	1.25	1.40	1.25	1.45
Grand Prize	....	....	.40	....	.30	....	.35	.40
Gould & Curry	2.20	....	2.20	2.30	2 05	2.35	2.30	2.45
Hale & Norcross	2.20	2.40	2.10	2.25	2.00	2.15	1.90	2.10
Julia	.30	.35	.30	.35	.30	....	.30	.35
Justice	1.40	1.55	1.55	....	1.35	1.45	1.50	1.55
Kentuck	1.60	1.85	1.80	2.35	1.95	2.20	1.95	2.20
Lady Wash	.50	....	.60	.65	.45	.50	.40	.50
Mono	.55	....	.60	.75	.65	*1.55	1.15	1.40
Mexican	3.40	3.50	3.30	3.40	3 00	3.20	3.10	3.15
Navajo	.30	....	.35	....	.35	.40	.40	.45
North Belle Isle	1.05	....	1.05	1.45	1.05	1.45	1.45	1.60
Nev. Queen	.75	....	.90	....	.75	....	.85	.90
Occidental	1.95	2.15	1.90	2.00	1.70	1.95	1.75	2.05
Ophir	5.00	5.25	5.00	5.37	4.70	5.00	4.65	4.90
Overman	2.25	2.45	2.35	2.45	2.15	2.35	2.25	2.30
Potosi	6.75	7.65	7.25	7.75	6.12	7.25	6.12	6.62
Peerless	.25	....	.25	.30	.25	.30	.35	.40
Peer	.20	.25	.25	.30	.25	.30	.25	.30
Savage	3.65	3.75	3.40	3.70	3.00	3.30	....	....
S. B. & M	1.50	1.60	1.45	1.50	1.25	1.50	1.25	1.40
Sierra Nevada	2.90	3.10	3.10	3.45	3.00	3.20	3.05	3.40
Silver Hill	.20	.35	.25	.30	.25	....	.20	.25
Scorpion	.25	....	.30	....	.25	....	.25	....
Union Con	2.85	3.05	2.90	3.30	2.90	3.10	2.90	3.15
Utah	1.10	1.20	1.15	1.35	1.15	1.25	1.15	1.30
Yellow Jacket	3.35	3.50	3.35	3.50	3.20	3.35	3.20	3.30

* Assessment delinquent.

Sales at San Francisco Stock Exchange.

THURSDAY, Oct. 30, 9:30 A.M.

		100 Kentuck	1.95
		75 Mexican	3.05
150	Alpha Con	1.75@1.80	50 Mono 1.25
700	Andes	2.15	200 Nevada Queen 90c
200	Belcher	2 75	300 North Belle Isle 1.50
500	Bodie	2.80	900 Occidental 1.85@1.90
400	Bullion	3.10	300 Overman 2.20@2.25
200	Bulwer	45c	200 Peerless 35c
250	Challenge Con	2.90	50 Savage 2.90
100	Chollar	3.15	200 Seg. Belcher 1.25
50	Confidence	7.00	100 Sierra Nevada 3.05
450	Con. Pacific	25c	700 Syn Scate 10c
200	Crown Point	2 60	200 Union Con 2.80
200	Exchequer	1.25	450 Weldon 20c
200	Julia	25c	400 West Comstock 60c
50	Justice	1.50	300 Yellow Jacket 3.00

Eastern Metal Markets.

By Telegraph.

NEW YORK, October 29.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	49¼	1 08	$16 75	$5 90	$21 35
Friday	48½	1 05	16 75	5 90	21 40
Saturday	48½	1 03	16 75	5 90	21 50
Monday	48¼	1 04	16 75	5 90	21 60
Tuesday	48⅜	1 06	16 75	6 75	21 35
Wednesday	49½	1 06¼	16 75	6 76	21 45

NEW YORK, October 27.—Quicksilver is steady. Copper—Consumers were well supplied ahead. Lake, 16¾@17c; Arizona, 16½c; Casting, 14¼@15c. Pig Lead—Light sales. Domestic, in carloads, $6.90@5 95; November, $5.66; December, $5.40. Foreign was quiet at $5 20@6.25. Tin is fairly firm. There are no short interests out.

Coal.

SPOT FROM YARD—PER TON.		TO LOAD—PER TON.	
Wellington, nominal	$12 00	Australian	$ 9 00@— —
Oreta	14 00	Liverpool Sm	8 60@— —
Carbon Hill	9 00	Scotch Splint	8 50@ 9 00
Nanaimo	11 00	Cardiff	8 50@— —
Oilman	11 00	Lehigh Lump	15 50@17 00
Seattle	11 00	Cumberland bk	13 00@— —
Coos Bay	11 00	Egg, hard	16 00@— —
Cannel	16 00		
Egg, hard	10 00	Coke—Englieh.	
Cumberland, in sacks	19 50		
do. bulk	18 00	To load	$12 00@13 00
Walleend	13 00@14 00	Spot, in bulk	16 00@18 00

All spot quotations subject to change without notice.

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ALTON H. CLOUGH, Secretary.

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Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 15th day of December, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

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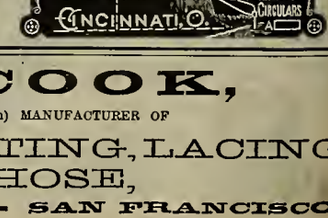
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10 SIZES FROM $7 TO $75
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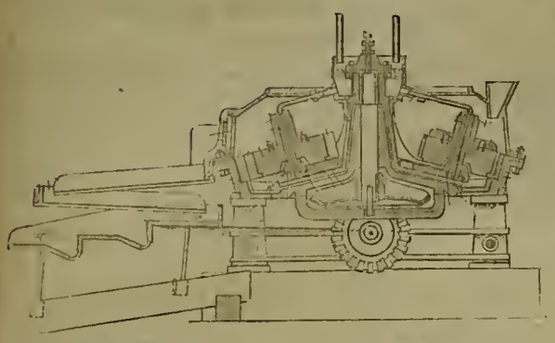

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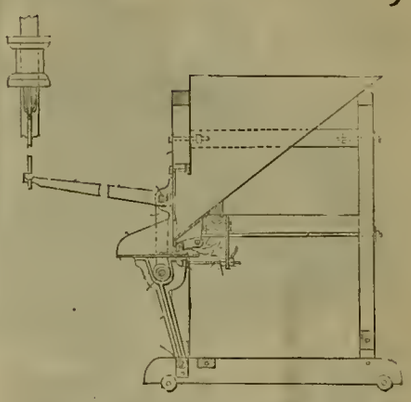
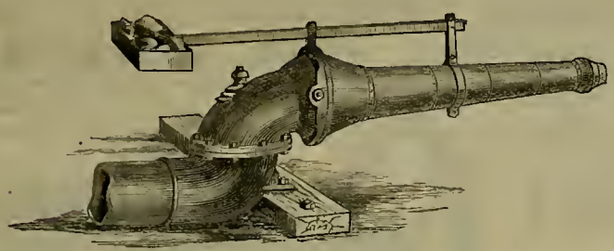
Will crush from 15 to 20 tons of hard ore per day and from 25 to 30 tons soft ore Lubricated by water only. Guaranteed to crush with least wear of any mill in the market.



HINKLE'S ORE FEEDER

Will feed Wet or Dry Ore, for either Stamp or Roller Mills.

IMPROVED FORM OF HYDRAULIC GIANTS.



THE ABOVE CUT ILLUSTRATES THE IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture. We guarantee purchasers of this form of Giants against all costs, expenses or damages which may arise from any adverse suits or actions at law. We are further prepared to furnish **Single-Jointed Giants** when required. Prices, discounts and Catalogues of our specialties of **Hydraulic Mining Machinery** sent on application.

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DRAWINGS, PLANS and SPECIFICATIONS made to new machinery.

Jobbing of every description promptly attended to. FINE WORKMANSHIP GUARANTEED.

LEVIATHAN COTTON BELTING.

Superior to all Others for Quartz Mills, Smelters, &c.

Not Affected by Wet, Steam, Heat or Oils. Every Belt Guaranteed. Try It. Send for Circular and Samples.

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"RED FLAX CORD"

SQUARE FLAX PACKING,

Manufactured from strictly first-class Flax and pure lubricants. Superior to all others for water and steam. Packs with less friction and makes a tighter joint than any other packing made. ☞ Imitations of inferior quality having been put upon the market, we have been compelled to adopt the above trade-mark, and all of our packing will now have a RED CORD running through the center its entire length. See that you get it and take no other. Sold by all Hardware dealers. Price, 50 cents per pound. **W. T. Y. SCHENCK**, Sole Manufacturer, **222 and 224 Market Street, San Francisco, Cal.**

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AUTOMATIC GOVERNOR MOTORS our Specialty, for Electric and other fine regulation work. Our new MINING WHEEL with GOVERNOR a great success. Send for new Catalogue.

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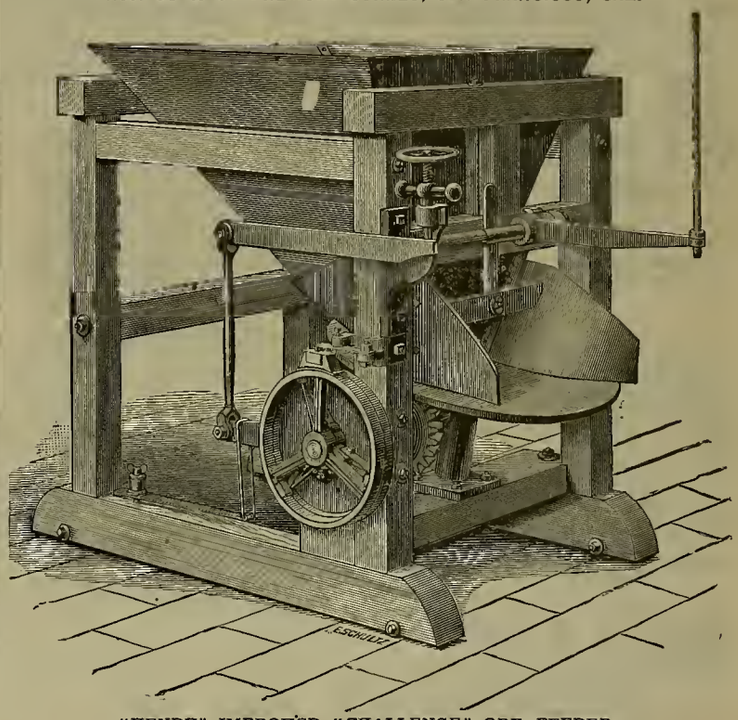

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The **best form of Feeder ever devised,** and pronounced by reputable mining men to be far superior to any form of "Roller" Feeder manufactured. We refer to the following gentlemen who have furnished us with testimonial letters to the above effect, which can be seen at our office, viz.:

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W. G. ROBERTS, Greenwood, El Dorado Co., Cal.
D. O. WICKHAM, Taylor Mine, Greenwood, Cal.
J. R. TREGLOAN, Supt. South Spring Hill Gold Mining Co., Amador City, Cal.

WE ARE MANUFACTURERS OF THE

'CHALLENGE," STANFORD," "TULLOCK," & "ROLLER" FEEDERS,

And will furnish descriptive Catalogues and quote prices upon application.

ADAMANTINE SHOES & DIES FOR STAMP MILLS.

These SHOES and DIES are in extensive use in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited, subject to above conditions.

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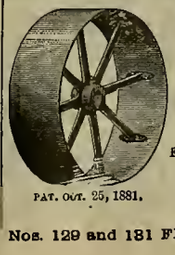
Special attention given to the purchase of Mine and Mill Supplies.



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☞ SEND FOR CIRCULARS AND PRICE LIST.

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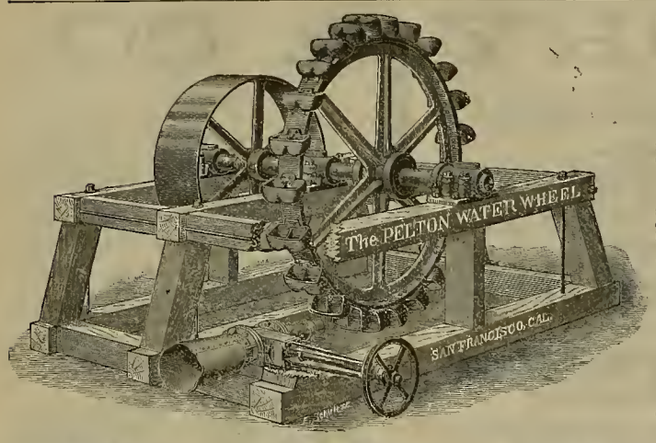

THE PELTON WATER WHEEL

Gives the Highest Efficiency of any Wheel in the World.
Over 1000 in Use.

Affords the most simple and reliable power for all mining and manufacturing machinery. Adapted to heads running from 20 up to 2000 or more feet. From 20 to 30 per cent better results guaranteed than can be produced from any other Wheel in the country.

ELECTRIC TRANSMISSION.

The advantages the Pelton Wheel affords in the way of a uniform and reliable power, close regulation, and the facility of adaptation to varying conditions of speed and pressure, have brought it into special prominence and extensive use for this class of work. All applications should state amount and head of water, power required, and for what purpose, with approximate length of pipe line. SEND FOR CATALOGUE.

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Pelton Water Motors.

Varying from the fraction of 1 up to 15 and 20-horse power, unequaled for all light-running machinery. Warranted to develop a given amount of power with one half the water required by any other.

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UNLIMITED IN CAPACITY — UNEQUALED IN EFFICIENCY.
UPWARD OF 2000 NOW IN USE.

Will do more than twice the work of any other with the same cost in wear. Gives a fineness of product that increases the capacity of any mill from 25 to 40 per cent without any additional expense.

THE BEST AND ONLY CRUSHER ADAPTED TO MACADAM ROAD WORK. SEND FOR CIRCULAR.

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BREWERIES,
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COLD STORAGE,
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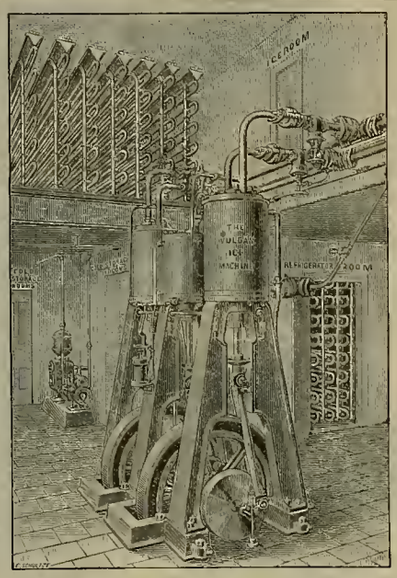

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The **25-ton Refrigerating Machine** has been running continuously since 1887 and has proved economical and satisfactory in every respect.

HOTEL RAFAEL, San Rafael.

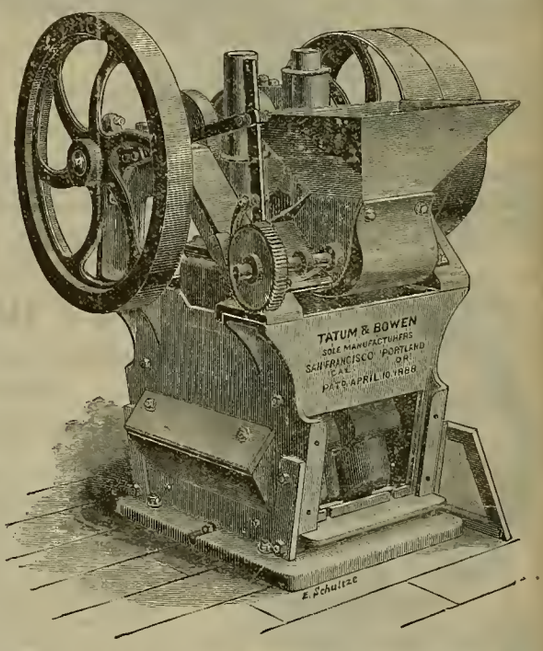
The "Vulcan" Ice and Refrigerating Plant is satisfactory in every respect, * * * * a model of good workmanship. The ice is clear.

CHAPMAN AMMONIA VALVES.
ANHYDROUS AMMONIA

VULCAN IRON WORKS, 135-145 FREMONT ST., SAN FRANCISCO.

— THE —

PERFECTED DOUBLE Economic Quartz Mill.



Attached to each Mill is an effective

Automatic Ore Feeder.

RAILROAD FLAT, CAL., May 15th, 1889.

MESSRS. TATUM & BOWEN, San Francisco—GENTLEMEN: I have had many inquiries in regard to the performance of your oscillating Stamp Quartz Mill, to all of which I have made substantially the following answer.

That it will crush and discharge through a No. 30 mesh wire screen, 6 tons of average quartz per 24 hours, that, compared with the common stamps, the power required to do the same amount of work is considerably less—the slipping motion of the stamps reducing the ore much faster than the drop alone can; that the discharge is good, and as to amalgamating and saving gold, my experience with it is that it is just about the same as the ordinary battery.

To the above I shall add that the new Automatic Feed attached is a perfect success. It can, in a moment and without stopping, be adjusted to feed just as "high" or "low" as desired, and can be depended upon to supply the stamps with ore exactly as they need it. This is important, as it saves feeding by hand, which cannot be considered at the present day, or the purchase of a high-priced feeder.

Considered as a convenient Mill for prospecting, or for a small mine, it fills the bill.

Yours truly, [Signed] JAS. S. REYNOLDS,
Supt. New York Mine, Railroad Flat.

The Mills as we make them now are Far Superior to the one at the New York Mine.

TATUM & BOWEN,

34 and 36 FREMONT ST., SAN FRANCISCO, CAL.,

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— MANUFACTURERS OF —

Centrifugal Roller Steel Mills,

FOR PULVERIZING ORES, WET OR DRY,

For Amalgamation or Concentration, and for Manufacture of Cement, Fertilizers, Paint and all other purposes for which grinding or pulverizing is required.

Send for Catalogue and Price List to

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Rock Drilling and Air Compressing Machinery

For TUNNELS, QUARRIES, MINES, RAILROADS

And Wherever Ore and Rock are to be Drilled and Blasted.

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— FOR —

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NO DUST! NO ASHES!
Portable! Practical! Automatic! Economical!

Will do for everything that a Coal Furnace or Gas Furnace will, and WITHOUT A BLOWER.

Send for Price List and Descriptive Circular to

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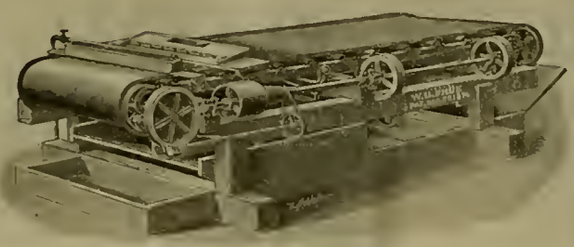
IMPROVED BELT FRUE ORE CONCENTRATOR.

The Best Ore Concentrator in the market, having double the Capacity and doing its work as close as the plain Belt machine, while its concentrations are clean. It is used in a number of Mills, the most notable of which is the Alaska M. & M. Co's Mill, where 24 Improved Belt Frues are taking the Pulp from 120 Stamps, crushing 350 tons per day, and is giving entire satisfaction as against 48 plain Belt Machines, taking the Pulp from the other 120 Stamps.

Price of Improved Belt Frue Vanner, $825, f. o. b.
Price of Plain Belt Frue Vanner, $575, f. o. b.

For Pamphlets, Testimonials and further information apply at office.



Protected by Patents December 22, 1874; September 2 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

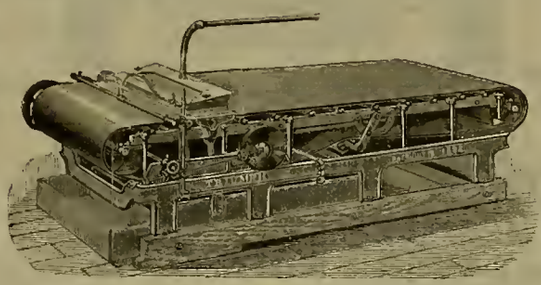
ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphs") can be mounted with a superior belt known as the "Blasdel" Riffled.

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be.
Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

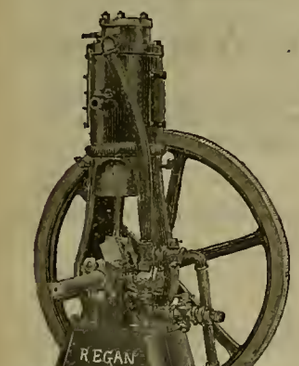
Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

REGAN VAPOR ENGINE.



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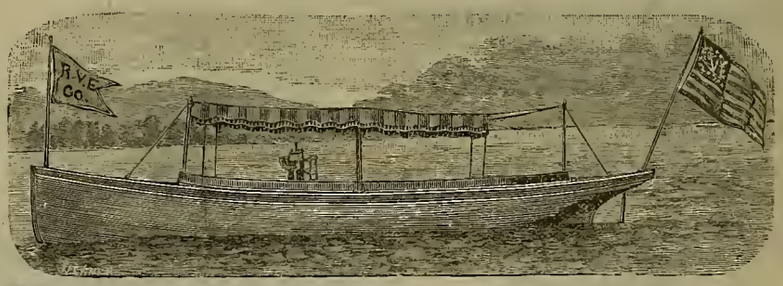
Simple, Compact and Cheap.
No Fire or Flame. Started Instantly without Even a Match.
No Ashes! No Explosion! No Engineer!
FULL POWER OBTAINED IMMEDIATELY.
The Moment Engine Ceases to Run, all Expense Stops.
NO DANGER.
Horizontal, Upright and Marine Vapor Engines and Launches.
Three-fourths to Fifteen Horsepower.
From $175 to $1200.
Send for Our Large Illustrated Catalogue.

GEORGE HAAS, 324 Market St., Phelan Building, }
SAN FRANCISCO, Feb. 21, 1890. }

REGAN VAPOR ENGINE CO.—Gentlemen: The 2 H. P. Engine you put up in our factory last November, has given satisfaction beyond my expectations. It do s my work better than than those two Electric Motors did, with scarcely any expense for gas. I paid the Motor Company $25 per month for power, while the Vapor Engine has cost me but $2 per month so far. But, be it understood, I have not used the Engine as much as in summer, but the cost of motor would have been all the same, making a saving of $50 in three months. I am satisfied the Engine will pay for itself in less than two years. I use it for freezing cream, run three fans, cocoanut grater, etc.
Yours truly, GEO. HAAS.



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The uses for small steamboats and launches are innumerable; they are convenient and service ble for transportation, and are a source of pleasure for those who are fond of sailing. But many have been deterred from purchasing such boats, because of the trouble and inconvenience of using coal, and the necessity of obtaining a Government license, engineer, etc. Our motor does away with these objections. The small space taken up by our engine in the boat **gives more room**; the boat will seat **twice** as many persons as one the same size fitted up with a steam engine. It takes only **two minutes to get under headway**, and can be stopped when running at full speed within the length of the boat, the reverse motion being instantaneous and effective. We carry in stock six regular sizes of hulls, from 18 to 33 feet in length, our models being the best that can be obtained, and built in the strongest and most substantial manner by Thos Kane & Co, Racine, Wis.

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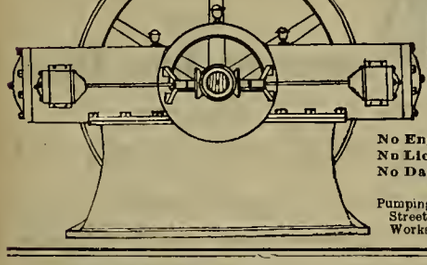
Power In or Out of the Shaft for Miners!

Our Perfected "Safety" Engines cost to run only 6 cents per working day and upward; they make their own vapor, and REVERSE instantly.



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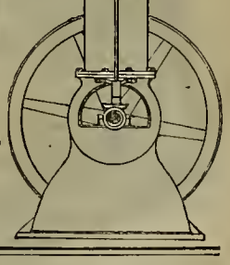
No Engineer, No License, No Danger.

Single, Double and Quadruple Acting.

½ H. P. to 100 H. P.



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Complete Plants of all kinds, Stationary or Mounted on Wheels.
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Concentrators and Ore Crushers,

Mining Machinery of Every Description. Steam Engines and Shingle Machines.

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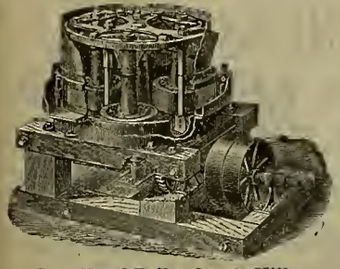

Centrifugal Roller Quartz Mill.

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IMPORTERS AND MANUFACTURERS OF

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ENGINES, BOILERS, STEAM PUMPS,
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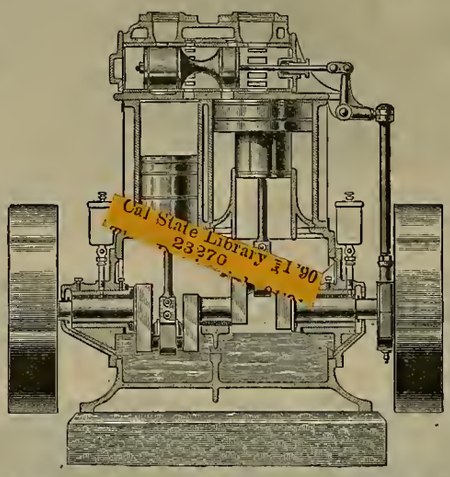
GOLDEN GATE CONCENTRATORS,
GREATEST CAPACITY OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps.



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SALES DURING LAST FOUR MONTHS:

COMPOUND, 44 ENGINES, 5215 HORSE POWER. STANDARD, 99 ENGINES, 4500 HORSE POWER. JUNIOR, 166 ENGINES, 4260 HORSE POWER.

Grand Total, 309 Engines, Aggregating 13,975 Horse Power.

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WIRE,
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Full Assortment Always in Stock.

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TRANSPORTATION OF ORE BY HALLIDIE'S PATENT WIRE ROPEWAY.

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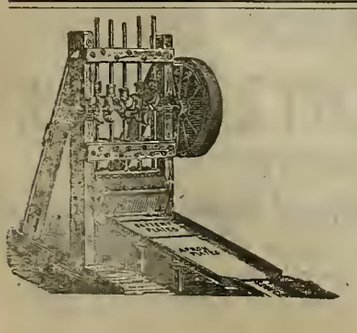

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An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 19. DEWEY & CO., PUBLISHERS. SAN FRANCISCO, SATURDAY, NOVEMBER 8, 1890. Three Dollars per Annum. Single Copies, 10 Cts.

The Davis-Colby Ore-Roaster.

The Davis-Colby ore-roaster for sulphurous iron ores is the outcome of some years of trial and practical experiences. The illustrations, taken from a paper by S. G. Valentine of Lebanon, Pa., will give a clear idea of the construction of the kiln. In general it consists of two shafts of brickwork inclosing between them an annular space, *E*, 18 to 24 inches in section, to contain the ore under treatment. The inner shaft, *F*, is continued to a proper hight above the top of the roaster to form the draft stack, as shown in Fig. 2, or it may be covered, as in Fig. 1, the products of combustion being carried downward and out through the flue, *F'*, to a separate chimney. This would allow of any utilization of the fumes deemed expedient. A cone-covered top, as shown, permits of more convenient charging, as ore can be dropped from car hoppers upon the cap, *L*, giving an even distribution of the ore. In the outer wall are placed the chutes, *C*, the fire arches, *B*, the gas flues, *X*, and the poking-holes and air flues, *Z*. Openings in the inner wall, *D*, admit the fumes and products of combustion to the draft stack, *F*. These openings are placed higher or lower, according to necessities arising from the character of the ore under treatment. The external shape, as shown in Figs. 2 and 3, is that of the Gjers kilns, which were remodeled to the new type. These illustrations are given to show how readily the ordinary style of roaster may be adapted to this new design. In some cases, particularly where dense, hard magnetites are to be roasted, the hight of the kiln is increased above that shown, for the purpose of giving the ore a longer exposure to heat; and the fire arches are put at a greater vertical distance apart, so that the ore may partially cool after its first heating, and be cracked or fissured, thereby exposing the remaining sulphur more thoroughly to the action at the second fire arches. A gallery around the outside, at the proper hight, gives workmen convenient access to fire arches and gas flues.

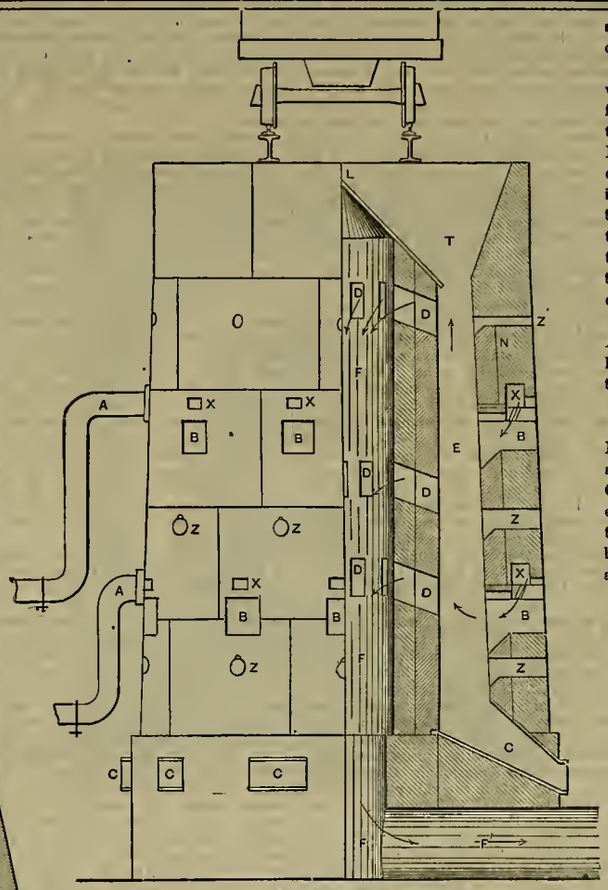

Fig. 1.—DOWN DRAFT DAVIS-COLBY ORE-ROASTER.

Gas from the mains *A* enters the flues *X* in the outer wall, and is distributed to each of the fire arches *B*, flowing downward through the outlets, as indicated by the arrows. Two or more sets of fire arches are used. In these the gas is burnt, the flame and heat impinging on the ore as it descends in the annular space *E*, raising it to any temperature required. This heating is done in the presence of abundant air, entering at the chutes *C*, the fire doors *B* and the poking-holes *Z*. After passing through the ore, the air enters the draft stack through the openings *D*, carrying with it the gaseous products of combustion and sulphur oxides from the ore.

The ore is filled in at the top *T*, passes down the space *E*, which gradually widens downward, and is drawn below from the chutes. Its cross-section being so narrow, the whole body of ore is thoroughly exposed to the fire.

MINES AND MINING AT THE FAIR.—The Committee on Mines and Mining of the World's Columbian Commission has organized, and the first meeting will be held at Chicago, Nov. 27th. It is proposed to have a building erected for the display of the products of the mines of the world. John W. Woodside of Philadelphia, a member of the committee representing the Middle, Atlantic and New England States, has issued a circular requesting all owners of mines and quarries, and manufacturers of mining machinery, who desire or propose to have exhibits, to communicate with him at 924 Arch street, Philadelphia, prior to Nov. 15th.

A VALUABLE Coal strike is reported in Sonora, Mexico.

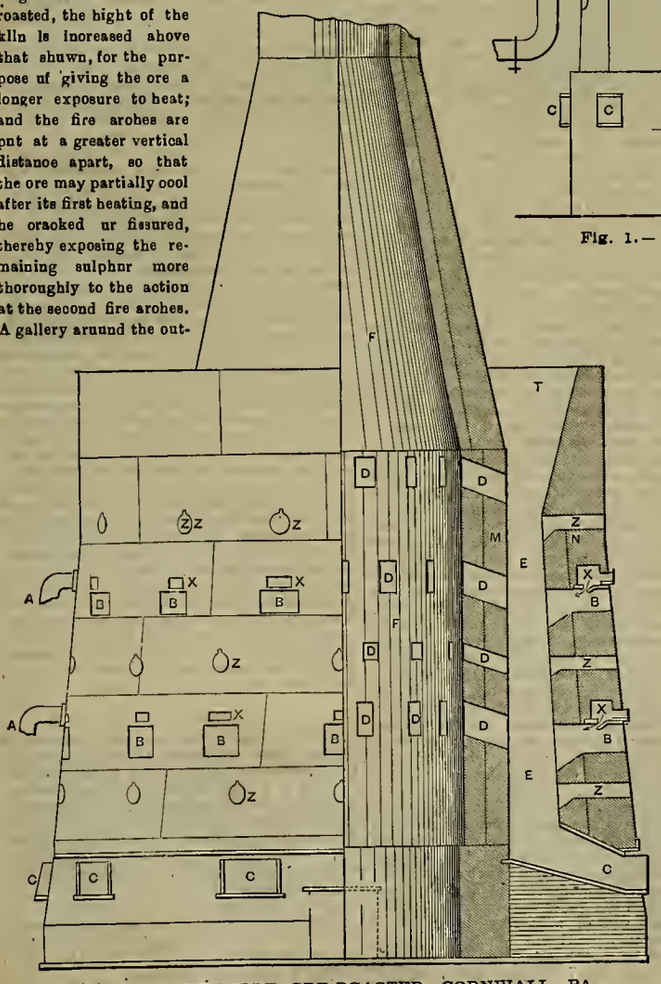

Fig. 2.—DAVIS-COLBY ORE-ROASTER, CORNWALL, PA.

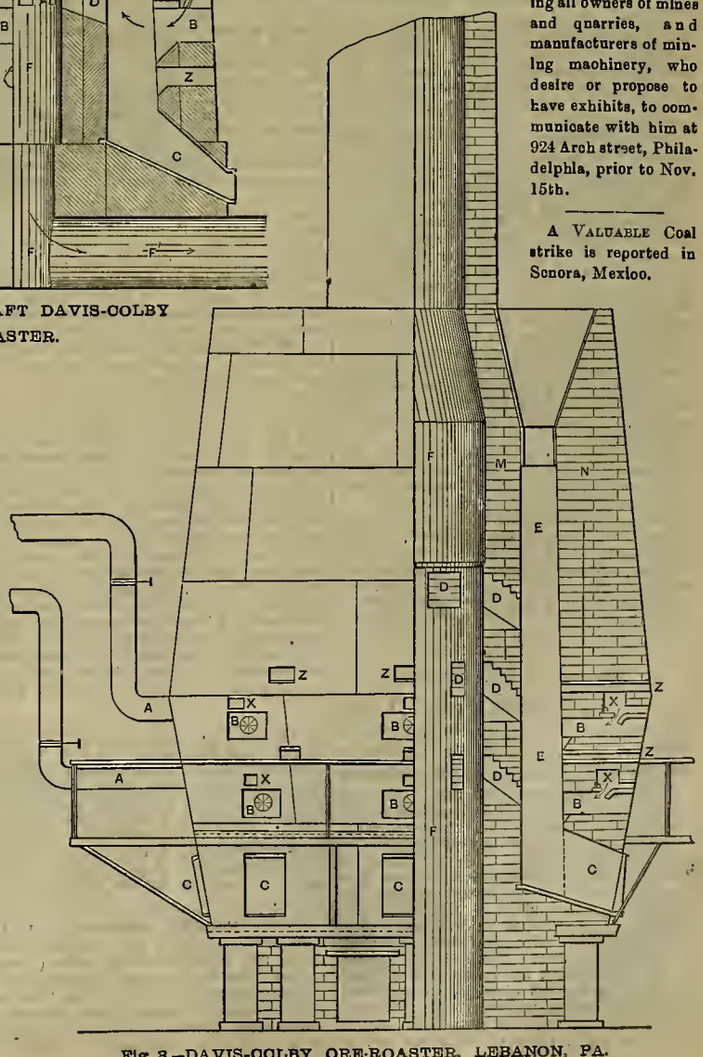

Fig. 3.—DAVIS-COLBY ORE-ROASTER, LEBANON, PA.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—Eds.

Auriferous Cement Deposits of South Dakota.

EDITORS PRESS:—I have been much interested in the late articles of Prof. Hanks and Mr. Talbot on the gravel deposits of California. As there seems to be a striking resemblance between them and the so-called "cement" mines of this section, a description of these mines and the most probable theory of their origin may interest your readers.

They consist for the most part of a deposit of well-rounded bowlders, gravel and sand, formed mostly from fragments of quartzite and slate derived undoubtedly from the slates and quartz veins underlying them.

This conglomerate has been so completely solidified by a siliceous cement that a fracture will pass through the rounded quartz pebbles instead of around them.

It is generally of a red color at and near the surface, but at distances varying from a few feet to several hundred from the surface the color is generally blue, the rock then often carrying a liberal percentage of sulphurets.

They rest upon the upturned and eroded edges of the archæn slates, often in depressions and hollows that would lead one to infer they were once ancient river channels, were it not for the almost completely rounded form of the bowlders and pebbles, which in a river wash would at least show some of the fragments of rock to be but partially worn, and generally of a more irregular shape than the gravel of an ocean beach, which they seem to have once formed.

The writer was brought up alongside the ocean, and when he first saw these cement mines, the resemblance to the shore deposits of the eroded bluffs of his native town was so striking as to almost cause homesickness.

The bluffs spoken of are composed of the same well-rounded bowlders and pebbles as in these cement mines, though lacking their mineral character. This cement (to still use the local term) is generally overlaid by a quartzite which has been altered from a sandstone by the same agencies undoubtedly which has changed the gravel below to a solid mass of rock. This quartzite seems to indicate a gradual submergence of the shore line and a deposit of the finer particles of sand as the ocean advanced upon the sinking land.

Above all is a porphyry capping, the overflow of numerous dikes which traverse the slates below as well as the cement and quartzite.

Admitting these deposits often occupy depressions in the slate (or bedrock as it is called) resembling river channels; may we not suppose these depressions a consequence of the slate being of a more yielding and easily eroded nature in such apparent channels than that forming the rim.

It may also be in some places that the action of streams has formed channels before the subsidence of the land to the ocean level, but even that being the case, the almost spherical form of the bowlders and gravel proves the ocean wash has replaced that of the stream or river. This cement deposit extends over entirely too great an area to be accounted for by any supposable system of river channels, aside from the fact that they seem to form a belt encircling the entire central part of the Black Hills and gradually changing to sandstone and quartzite, as they recede from the Hills.

There have been many Californians here who have mined in the deep placers of that country, who claim a strong resemblance between the so-called channels here and there; still there are, no doubt, essential differences in their geological situation.

The overlying quartzite is, I believe, not found in California deposits, but that would seem to only prove the gradual elevation of the land instead of its subsidence as here.

The application of this theory to the deep placers of California is only suggestive, and can only be examined by one on the ground satisfactorily, and perhaps some of your readers may be able to give some of the results of their observations which would throw some light on the subject.

W. H. WASHBURN.

Deadwood, Oct. 19, 1890.

Notes from New Mexico.

EDITORS PRESS:—While at Deming, I heard considerable talk about the projected railroad from that point southward into Old Mexico, where it is known that the road would tap and open up an extensive and rich mining and agricultural region. This talk had received its late stimulus from the visit of an expert sent out to this country by a syndicate of English capitalists, who have signified their willingness to push the venture in case the expert now here can verify the previous reports made to the syndicate by the officers of the railroad in America. Our correspondent was surprised to see that much work had already been done upon the railroad in question. It is already graded for 50 miles or more, and could be speedily put in operation for that distance, which would take it into Mexican territory. The plan contemplates running into Mexico to the east of the Sierra Madre range of mountains, and at favorable points running branches to Chihuahua on the east and Topolobampo on the west. The probable future business of the road was indicated, to a degree at least, by the loads of ore which our correspondent saw hauled into Deming during his brief visit. There were several ox or mule teams, all freighting ore from mines 80 to 90 miles south of Deming, at which latter point it was to be sent by rail to the smelters at El Paso, Denver or Pueblo. The money so far expended on the Deming & Mexican railroad has been advanced by capitalists from Ohio and other Eastern States. This would be an important railroad, and if built will tend greatly to benefit Deming, its American terminus.

Socorro.

The town of Socorro presents a characteristic illustration of the ups and downs of a mining camp or settlement. There are no mines immediately at Socorro, but a number of years ago the mountains back from that old town were found to contain many excellent prospects and people flocked in from all directions. The mines were developed and the entire region had a mining boom. Socorro prospered amazingly and business houses, residences and structures of all kinds went up by the score. It is said that the city contained a population of 10,000 souls. It was the headquarters for teamsters, who had an immense business in hauling ores from the mountainous regions around Magdalena and Kelly to Socorro, where an extensive smelter was erected, and where also the ores were shipped to other points by rail. In recent years a railroad has been built from Magdalena direct to the Socorro smelter, and to a connection with the Santa Fe railroad at Socorro. This has put a quietus upon the teaming business which so stimulated Socorro's growth. Many of the mining properties have ceased to be worked and there has been a gradual shrinkage of the mining interests immediately adjacent to the old town. The camps of Magdalena and Kelly continue to thrive, but Socorro has become partially depopulated. There are dozens of vacant store buildings and scores of adobe and frame residences which stand as evidences of what Socorro must have been in her palmy days. There are still several plucky and enterprising merchants in the city who yet do a fair business with the people of the surrounding country. The decline at Socorro has probably "struck bottom," and from now on there will be a tendency upward. The smelter, located within a mile or two of town, employs 125 men, and in its three furnaces, works up some 125 tons of ore per day. This ore comes mainly from Magdalena and Kelly, but a goodly portion of the supply also comes from other parts of New Mexico, from Arizona, and from Old Mexico. The mines of the mountainous district back from Socorro are beginning to attract renewed attention, especially since there is a better look for silver-copper properties, and since new methods in the reduction of ores are supplanting old and extravagant methods. We look for prosperous times in the vicinity of Socorro, and perhaps the town may yet revive and take rank as one of the Territory's leading cities. It still has a population of 500 or more, is the county seat of Socorro county, and is a pleasantly situated and healthful city. It is in the valley of the Rio Grande, 75 miles below Albuquerque, on the line of the Santa Fe railroad from that city to El Paso, Texas, from which latter place it is distant 178 miles. An extensive milling plant in the outskirts of Socorro is now idle, but it is thought the stamps may begin dropping some time the coming winter. Besides the smelting company in Socorro, Sperling Bros., merchants, H. R. Brown of the Central hotel, and Geo. H. Thwaites, are enterprising citizens interested in mining matters. P.

Socorro, New Mexico, Oct. 23, 1890.

A BIG BUSINESS.—The business year of the house of Armour & Co., Chicago, closed October 1st, and the exhibit which this firm presents for the past year is interesting for the magnitude of its operations. The sales amounted to $55,000,000, which has far exceeded any previous year, and over 27 per cent of the total killing at Chicago for the year. They slaughtered 650,000 cattle during the year, and also 350,000 sheep. The gross weight of these 1,000,000 animals is not stated, but was approximately 1,150,000,000 pounds, or 575,000 tons, equivalent to 48,000 carloads of 12 tons each, or an average exceeding 150 cars for each business day of the year. Employment is given to 7000 persons, whose wages amount to $3,500,000.

ELECTRICITY ON THE NEW YORK ELEVATED ROADS.—The managers of the New York City elevated roads, it is said, have not abandoned the plan to propel the trains by electricity. Russell Sage says the day is not far distant when electricity will supersede steam on the elevated roads, and horses will be no more used on the surface lines. He believes the cost of operating the elevated lines could be reduced nearly ten per cent by the adoption of electricity.

AT the Electrical Exhibition of 1881 the most powerful dynamo was an Edison machine, giving 800 amperes and 110 volts (120-horse power). The Berlin central stations now have 500-horse power dynamos, and at Deptford a 3000-horse power alternator is at work, and two 10,000-horse power machines are expected shortly to be in operation.

Coal in the Black Hills.

Coal has been found at a number of places, the first discovery of importance being at the Hay Creek mines, located northwest of Deadwood and northeast of Sun Dance. The bed was variable in thickness and quality, and, while superior to the ordinary lignites of the Laramie group, was not pure enough to encourage active developments. Some fairly good prospects were found between Sun Dance and Newcastle, on the west side of the Black Hills. The best area developed at this date is at Newcastle, the present terminus of the Black Hills branch of the Chicago, Burlington & Quincy system, on which the rails have just been laid. The coal occurs, apparently in the Dakota sandstone group, which here consists of three massive sandstones, ranging from 50 to 100 feet in thickness, and separated by soft shales and slates, the whole having a combined thickness of perhaps something more than 300 feet. The principal coal-bed is found above the lower sandstone which directly overlies the red-beds of the Jura-Triassic. In the absence of proper paleontological evidence, we cannot positively assert the Dakota age of this coal horizon, but the apparent integrity of this sandstone group as a whole, warrants the assumption that the coal is of cretaceous age; for the upper member of the group seems certainly Dakota, and to whatever the top-rock belongs, the lower portion must also be assigned.

Shortly after explorations were commenced, I found that the outcrop of the coal had been burnt, and the search for coal became at once a search for ashes. The area in which the explorations were made was a plateau or table ranging from 600 up to 1200 feet above the plains to the west (from which it gradually rises) and cut by frequent sharp canyons, 200 to 500 feet deep, along the sides of which the outcrop of the coal was usually above water level. In some localities the outcrop was readily found, and the full thickness of coal was exposed by drifting a few feet; but where the outcrop had been burnt the coal was rarely found until the ashes and burnt rock had been drifted upon from 50 to 100 feet. The coal is one of the varieties difficult to classify, bearing intimate relations to coals both of bituminous and of lignitic composition. It is black and lustrous with a somewhat conchoidal fracture, and good coking properties. From its appearance and coking properties one might be justified in classing it as a true bituminous coal, but in chemical composition it is also closely allied to the lignites.

This coal will doubtless find a large market in Wyoming, Nebraska, Dakota and Montana. For domestic purposes, and for railroad and steaming use generally, it is far superior to any of the true lignites. The percentage of ash and water is moderate (averaging less than eight per cent), being somewhat higher than Rock Springs coal. The samples analyzed contained more sulphur than Rock Springs coal, but less than many of the Iowa and Missouri coals on which Nebraska is now largely dependent; and the ash percentage was very much lower than in most of these Missouri and Iowa coals. It is a strong steam coal, is very hard, does not slack upon exposure, and will bear transportation and handling well. Its coking properties have already been described. The Dakota sandstone is not generally known as a coal-bearing formation. In a paper read before the Institute, in October, 1888 (*Trans.* XVII., 375), Mr. G. C Hewett notes the occurrence of coal in the Dakota sandstone between the White and Yampa rivers, in Northwestern Colorado, which may correspond to the horizon of the Wyoming bed.

The developments made up to date indicate clearly that while in certain districts coal-beds of workable thickness and quality exist in this Dakota sandstone formation, the workable coal is not co-extensive with the formation; in other words, the presence of this formation in any locality is merely an indication that workable coal may possibly exist. At the time my examinations were completed, the bed developed in the Newcastle field showed from 4 to 7½ feet of workable coal with no important slate partings. Subsequent explorations, I am informed, have shown the presence of a considerable area, ranging from 8 to 9 feet in thickness. From the Belle Fourche west to the Big Horn mountains, the typical lignites of the Laramie group are finely exposed by repeated natural outcrops in canyons and cliffs, more especially on the headwaters of Donkey creek, Horse creek, Wild Horse creek, and the numerous affluents of the Powder river. These lignite beds range from 3 to 4 feet up to 22 feet in thickness, and are admirably situated for mining, being above water-level, and lying almost flat, so as to present many points at which self-draining mines may be opened and cheaply operated. Averaging about 20 per cent in water, these coals have low calorific value; and "slacking" upon exposure to the air (by drying), they will not bear transportation. Hence, while useful as a local fuel supply, they are not likely to become commercially valuable until some cheap method is devised for artificially evaporating the water and manufacturing a "briquette," or artificial fuel. Their low percentage of sulphur and ash would assure the production of a most excellent fuel, and the problem seems to be purely one of cost and of mastering the details of manufacture.

The area of this lignite field is very great, certainly more than 7000 square miles; and that some method of utilizing this enormous body of fuel will ultimately be devised, we cannot doubt. I believe a fuel equal to the best bituminous coal could be produced from these lignites artificially at a cost of about $2 per ton, and such a fuel would have one great advantage over ordinary bituminous coal, as it would reach the consumer in blocks (or eggs or spheres) of uniform shape, size and composition. —*H. M. Chance, M. E.*

The Cause of It.

No doubt all who have been depressed and disgruntled by the unusual duration of hot, dry weather will be glad to know the reason why the peculiar phenomena exist and continue so long, and why we had a wet October last year and just the opposite this year. Lieut. Finley of the Signal Service, being interviewed by a city reporter gave the following interesting statement:

"It is true that the difference between the temperature of this month and that of October, 1889, is most marked. In the latter month there was not a single day when rain did not fall somewhere on the Pacific Coast.

"In October, 1889," said the lieutenant, "the rains which came from the Japan current moved eastward over British Columbia, carrying the rain center northward of this portion of the United States. They then moved farther south, carrying the area of precipitation into California. In October, 1890, these storms have moved eastward so far north that the rain which attended them has been confined to Oregon and Washington, and did not reach California.

"As to the north winds which for the past week have prevailed, bringing a heated spell, they are due entirely to the presence of an area of dry air and clear weather prevailing over Nevada, Utah and South Idaho, with a slight depression of the barometer just off the coast of Southern California. This area of dry weather is called on the charts 'high,' because the air is denser and heavier. The depression off the coast of California is called 'low,' because the air is moist and lighter. The north winds result from the movement of the clear, dry air of the 'high' to the warm, moist air of the 'low.' There is a gradience between the two which causes the air to flow away from the place of the highest pressure to the lowest. The air in moving from the 'high' to the 'low' is obliged to pass over the heated sandy soils of Nevada, and by the time they reach California have absorbed an enormous quantity of heat. They therefore appear as scorching hot winds. The sun beats down from a cloudless sky on the desert regions of Nevada, and the earth becomes quickly heated to a high degree, so that the air as it passes over the ground takes up the heat of the soil and carries it onward."

At the time of the interview on Tuesday last, Lieut. Finley thought the same weather might prevail a couple of days longer at least. A rainstorm hreaking loose from the Japan current seems to be our hope for relief, and we trust it will not be long delayed, though this weather has done well in bringing in the outstanding fruit in the best condition.

FREEZING QUICKSANDS.—Quicksands have always been one of the most formidable engineering obstacles in shaft-sinking and in building foundations for bridge piers, but by the use of freezing mixtures these obstacles may be overcome. The common method of circulating the freezing mixtures is by means of a line of vertical tubes driven into the sand a short distance apart and just outside the circumference of the desired opening or shaft. When the freezing fluid is forced into the pipes the quicksand gradually solidifies into a firm, hard wall of sufficient strength to retain its shape while the inclosed shaft is being excavated and lined. This method has been often used in bridge-work, and recently it has been very successfully applied in shaft-sinking in the Lake Superior ore-mining region, where strata of thin quicksand have been encountered some distance below the surface. A more recent method of overcoming the same obstacle has been devised by a German engineer, Fr. Nenkirch, of Bremen. This method is quite similar to the freezing process, the refrigerating mixtures being replaced by cement. Iron tubes, pointed and perforated at their lower ends, are thrust into the quicksand at intervals of 10 or 15 inches on the area of the desired work, and when the proper depth has been reached, cement is forced through the pipes by a current of compressed air. The blast of air thoroughly mixes the cement with the sand and water, and a solid mass is quickly formed.

A BOOK FOR ALL WHO TRAVEL BY RAIL.—We are indebted to the Bancroft Company for a copy of the American Geological Railway Guide, wherein the geological features of the country adjacent to every railway station, with altitudes, etc., are given; also remarks on leading places along the various routes. While this is a work of interest to every class of readers, it must prove especially useful to those who travel much by rail. To be had of the Bancroft Co. of this city.

THE crude material of asbestos has a demand in London from £18 to £100 per ton—$500 per ton, American money. The Bell Company's output is 2000 tons per annum.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XVIII.

[Written for the PRESS by JAMES H. CROSEMAN.]

The Lava-Bed Mining District

Is situated in the Lava-bed Range of mountains, a southeasterly prolongation of the Ord Range, and at a point 26 miles nearly east from Daggett. Formation, syenitic and porphyritic; strike of the strata north 22 degrees east; greatest elevation, 4175 feet. In this mountain occur several powerful veins which crop from 10 to 50 feet in hight and are traceable for long distances on their line of strike. The principal mining locations here are as follows:

The Mammoth,

Which cuts the formation at an acute angle, its course being N. 70 degrees west with a southerly dip of 80 degrees. The vein is of banded structure and carries four feet of good ore. It measures from wall to wall from 20 to 40 feet, and has heavy croppings the full length of the claim. In places it rises to a vertical hight of 25 feet, resembling a mammoth wall. Below the surface the vein has been much broken and disturbed from the effect of volcanic action, non-mineral bearing foreign matter having been injected into the quartz or gangue, reducing the value of the mass. This claim has been developed by two shafts—one 20 and the other 30 feet in depth. The gangue proper is composed of quartz and heavy spar. The assay value of the ores in silver varies from 20 to 95 ounces per ton, and from 5 to 15 per cent lead in the form of carbonates and sulphides.

The Meteor,

An extension of the Mammoth, carries bold, heavy croppings and has a width between its incasing walls of from 9 to 20 feet. Its gangue is quartz and a brecciated mass of volcanic rock. The ores are a soft carbonate of lead, with spots and bunches of galena which run high in silver. It is reported that this mine has yielded in silver values $20,000. The developments consist of a drift on the lode 38 feet, a crosscut 40 feet, with lateral drift of 40 feet. Shaft 90 feet deep, with good ore in the bottom 4 feet wide.

The Rising Sun

Lies parallel with the Meteor on its northerly side. Width of vein 8 feet; formation similar to the Meteor; developed by a 75-foot tunnel, and in the middle of the claim an open cut. Value, 40 to 50 oz. silver per ton.

Five miles in a northerly direction from this mine in the center of a low depression or dry lake, two volcanic cones are seen, their cup-shaped craters being plainly visible in the bed of the largest dry lake, which covers an area of 25 square miles at an elevation of 1920 feet. Two wells have been sunk, the one to a depth of 60 and the other of 90 feet. From these an inexhaustible supply of water is obtained. At a greater depth, in all probability, artesian water could be procured. At the Warm Springs Dry Lake, 20 miles westerly from this point, an inexhaustible supply of water can be obtained but a few feet from the surface, demonstrating that while the surface may be void of moisture, the substratum at varying depths is thoroughly saturated.

The Morning Star Mine

Lies at the extreme easterly end of the Lava-bed Range at an elevation of 3050 feet. The strike of the lode is north 70 degrees west. The comb of the vein rises above the surface to a hight of 35 feet and measures 20 feet between its incasing wall, but carries only four feet of ore, which is reported to assay 30 ounces per ton in silver. At this point a tunnel has been driven in on the lode a short distance; thence in a westerly direction 350 feet on the strike of the vein, a second tunnel has been driven connecting with a vertical shaft sunk in good ore to a depth of 70 feet, where some stoping has been done. From the tunnel level two winzes have been put down 30 and 70 feet. Tunnel No. 3 has been driven in on the south wall of the vein, carrying four feet of low-grade ore, from which a diagonal crosscut has been driven for a distance of 150 feet. The croppings, which are bold and strong, expose some good ore 12 feet in thickness. Two hundred and fifty feet distant, in a southerly direction, a spur falls into the main vein which carries galena assaying 45 per cent in lead and $7 in silver. The spurs and feeders that fall in from the north side of the lode all carry galena; on one of these an 80-foot tunnel has been driven.

The Pequot,

Though a strong vein, has been but little developed.

The Tip Top Vein

Strikes north 70 degrees west; dip 45 degrees northeasterly; vein 10 feet wide; gangue a dark ferruginous quartz assaying $24.50 in gold.

The Everett Lode

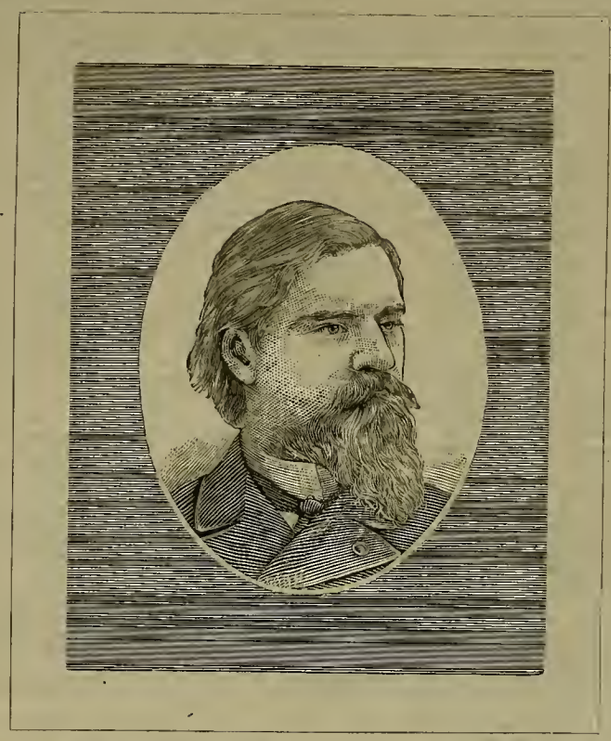
Lies at an elevation of 2950 feet; vein 18 feet wide, carrying four feet of ore which assays nine ounces silver per ton, developed by a shaft 60 feet deep and two drifts respectively 25 and 30 feet long; walls well defined. The ores of these mines are hand-picked and are shipped to San Francisco by the company, there being no reduction works in the vicinity of the mine.

Dry Lake District

Lies immediately south of the Lava Bed, in Tp. 6 W., R. 4 E., comprising an area of 36 square miles. In this district a number of locations have been made, though little work has as yet been done upon them. The ores carry silver, gold and lead. A. F. Lucas is developing a gold-bearing mine here that promises to prove a valuable property.

The Twenty-Nine Palm District,

Which covers an area of 360 square miles, derives its name from a group of palms surrounding several living springs of pure water which serve to irrigate a considerable area of the surrounding country, now under a good state of cultivation. Several arastras are run here on gold-bearing quartz. This district has been subdivided and the Virginia Dale and Minnie McConckey districts segregated from it. The former is located 31 miles in a southerly direction from Bagdad on the Atlantic & Pacific R. R. and 75 miles from Banning, a station on the Southern Pacific. The isolated position of the mines here has hitherto prevented their being generally known, notwithstanding the strength and persistence of the veins and the unusual richness of the ores, which consist of silver, copper and lead—the latter in the form of sulphides, oxides and carbonates, with chlorides of silver—some of the veins being exclusively gold-bearing. In this district are four locations on a continuous vein four feet in width, known as the Rattler, Virginia Dale, Wilson and South End. In all, some 40 locations have been made. The developments of the Virginia



COLONEL GEORGE R. DAVIS, DIRECTOR-GENERAL OF THE WORLD'S FAIR.

Dale consist of Shaft No. 1, 146 feet in depth, Shaft No. 2, 100 feet deep, connected by longitudinal drifts 100 feet in length, which have been extended northerly and southerly 100 feet farther on the line of the vein. Winzes have also been sunk to depths of from 50 to 100 feet on the vein. Enough stoping has been done to prove the gold-bearing character and value of the ores. The mine is under the management of I. C. Youngman of Pomona—the incorporation being known as the Virginia Dale Mill and Mining Co. The Clip mine, situated three miles to the east, has been developed by a 25-foot shaft, ledge 6 feet between walls, all ore which has paid $20 per ton in free gold by the mill process.

In the vicinity of these mines two wells have been sunk 600 feet apart, affording an abundant supply of water. One is 195 feet deep, the other 95 feet. For working the ores of this locality a 5-stamp mill has been erected at a point five miles distant from the mines.

The 29 Palms group of mines is situated from 15 to 28 miles distant in a southeasterly direction, the formation being porphyry and granite, with a belt of limestone lying on the south side; the veins course east and west.

The McConckey mine has been developed by a shaft 100 feet deep. The ores contain copper, lead and silver.

The Minnie McConckey District,

Which was discovered and formed in 1886, is situated 18 miles southeast of 29 Palms, six miles from Lyons mills, and eight miles south of the Virginia Dale mine and range of mountains. The True Business, situated in this district, has been developed by a shaft sunk on the inclination of the lode to a depth of 100 feet. Another shaft 600 feet easterly has been sunk to a depth of 25 feet, both being in high-grade ore, vein strong and well defined, incased in walls of limestone and granite. The ores are reported to carry lead, silver and gold in the proportion of, 50 per cent lead, 25 to 75 oz. silver and from $50 to $100 in gold per ton. Six locations have been made on this vein westerly from the discovery and one easterly. An adit level has been commenced which will tap the vein at a depth of 150 feet at a distance of 200 feet. Seven miles distant from the mine a well has been sunk to a depth of 90 feet, affording an abundant supply of water for milling purposes. The croppings on the surface of the vein at its point of greatest expansion vary in width from 25 to 30 feet.

The Big Mesquit Mine,

Which lies southeasterly from and three miles distant from the above, carries the same class of ore, but the vein is not so large and with less development. Lying to the north, we find the Poliz mine, of a similar character. The Eagle mountain copper mines, situated 20 miles south of 29 Palms, carry copper, silver and gold; vein from 4 to 6 feet in width; value of ore from $60 to $70 per ton. In the vicinity of 29 Palms, a quartz vein 2 to 10 feet in width occurs. It carries a rich streak of gold ore which the owners are working by a hand mortar.

Bagdad district is situated northeast of 29 Palms in the Bagdad Range of mountains and seven miles from Bagdad Station on the A. & P. R. R. A group of small veins occurs here carrying lead and silver. These veins, though small, are persistent on their line of strike and carry 30 per cent of lead and an average of 25 ounces silver per ton. Select samples run as high as $4000 in silver. Some 40 locations have been made here. The deepest shaft is 30 feet; formation, porphyry. The principal locations are owned by Messrs. Corley, Gass & Vickey.

The Grapevine Mining District

Is situated north of the Mojave river and west of the Calico mining district. Its formation is composed of feldspathic, porphyritic and calcareous rocks, much changed from the effects of subterranean heat. Strong and well-defined metalliferous veins occur here carrying the ores of silver and lead.

The Stonewall Jackson mine lies six miles in a northwesterly direction from Baratow, a railroad station, and in the vicinity of the Waterman silver mine. Strike of vein, northwest and southeast, developed by an incline shaft 36 feet deep, Dip of lode for the first 28 feet is 40°, and for the remaining 8 feet, 60°. Vein at bottom shows a width of eight feet between walls; gangue quartz; mineral, galena and carbonates of lead carrying considerable iron oxides.

The Beauregard,

Located on the above vein, has a northerly strike and is of the same character of ore as found on the Stonewall Jackson.

The next adjoining claim on the line of the lead is the Honeycomb; strike northwest and southeast, developed by shaft 9 feet deep and 12 feet wide. The next claim is the No Name; shaft 35 feet deep, all in ore of same character as Stonewall. Another shaft, 200 feet distant on the line of the lode, has been sunk to a depth of 40 feet; inclination of lode, 65°. The Ventura and Jupiter adjoin and are developed by shafts and cuts carrying ore of like character as above.

The Cleveland Mine,

Located on a lone mountain near the Calico district's boundary line, is distant five miles northwest from Daggett and four from the town of Calico. This mine has been developed by an incline shaft 170 feet deep. Vein dips E. 35 degrees. A crosscut shows the width of the vein to be 14 feet, the richest portion lying on the footwall. Hanging-wall, porphyry; foot a decomposed feldspathic rock. Samples of average ore sent to the Selby Smelting Works yielded 26 per cent lead and 20 ounces silver per ton.

The Cuticura,

Which adjoins the Cleveland on the west, is a parallel lode; formation, calcareous shale metamorphosed and changed; strike northwest and southeast; dip, northeasterly at an angle of 60 degrees; gangue, lime and quartz; ores, silver-bearing carbonates and oxides of lead; vein four feet in width and well defined, developed by a shaft 60 feet deep, with several open cuts. Cornish rolls and jigs have recently been erected on the property and as reported successfully and profitably worked; concentrates shipped to Selby in San Francisco.

On the Midnight, an easterly extension of the Cuticura, but little work has been done. It has, however, the same class of ore with concentrating works. This desert region contains numerous other veins carrying the ores of lead and silver, all sufficiently rich at current rates to warrant treatment by concentration, and in the absence of a smelting plant, to ship the concentrates to San Francisco, for sale or reduction.

The Waterman Mine,

Which has been extensively worked and large values extracted, is by no means exhausted, though now lying idle, litigation having prevented resumption of work here. In the vicinity of the Waterman a vein is being developed that runs high in silver, and the owners have every confidence in the future of the property. This is known as a blind vein, as it did not crop on the surface. It is being developed by a shaft, and judging from the strike it is the same as the Waterman, the character of the gangue and the ore being similar—the first contains baryta and quartz, the latter being rich in the chlorides of silver. Jas. Waters of San Bernardino is one of the principal owners of this mine.

(To be Continued.)

The Director of the World's Fair.

Colonel Geo. R. Davis, Director-General of the World's Fair, whose portrait we present on this page, was born at Three Rivers, Palmer, Mass., Jan. 3, 1840, and educated in the public schools, and at Williston Seminary, where he graduated in 1860. Entering upon the study of law, he was admitted in due course, but in 1860 forsook his chosen profession to join the Union army. He enlisted in the Eighth Massachusetts Volunteer Infantry, and soon became a captain. At the close of the contest he became a resident of Chicago, still retaining his interest in military matters. He took a leading part in the organization of the local militia, and was made commander of the First Regiment of Infantry, Illinois National Guard, and senior colonel in the State service. In 1876 he was nominated for Congress by the Republicans of his district and defeated, though running largely ahead of the Presidential ticket. Two years later he was more successful and was elected. He was re-elected in 1880, and again in 1882. At present Colonel Davis holds the position of Treasurer of Cook county, of which Chicago is the seat.

BRITISH SHIPBUILDING.—Lloyd's Register Shipbuilding Returns for the last quarter show unmistakable signs of falling off throughout the whole of the United Kingdom. The decline was to be expected from the high rates of materials and wages. The tonnage of vessels building is 123,000 less than the preceding three months; and the number of vessels preparing to be built shows a decline of 87,000 tons. Of vessels at present in hand, more are being built on "spec." than in the preceding quarter; and as compared with the same period a year ago, the falling off in this respect is very marked. On the Clyde there is a reduction of 49 vessels, the number for the last quarter being 114 in place of 163 in the preceding period; on the Tyne there are 66 vessels as compared with 72; on the Wear 47 instead of 59; in the Hartlepool district 50 in place of 59. The tonnage of the vessels under construction is also less in proportion. When materials and wages have adjusted themselves to the altered state of matters, we may hope for a revival, as shipowners are holding off, being unwilling to place orders on a falling market which has not yet by any means reached its lowest point.

MAKING IRON WITHOUT PUDDLING.—Dr. Emmens of Greensburg, Pa., is said to be the discoverer of a process of making wrought iron from pig metal without puddling. A vat is filled with a chemical solution and a number of thin sheet-iron plates. The pig iron is also placed in the vat, and the two metals are connected to a dynamo. The current, which is then passed through the vat, is said to have the effect of causing the pure iron to be separated from the impurities in the pig iron, and to form a deposit on the sheet-iron plates. It is claimed that the wrought iron produced can be bent, rolled or twisted into any shape while cold, and is superior to the best Swedish metal. Dr. Emmens says he can take a horseshoe nail of this iron, fasten the head in a vise, and twist it into an almost perfect screw without breaking it.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Inyo.

ORE SHIPMENTS.—*Index*, Oct. 29: The Brown Monster mine shipped one and one-half carloads of ore this week. At each trip from the Defiance mine at Darwin, J. V. Skinner brings in ten tons of ore. The mine is looking very well and improving as more opening is made. The new water works is nearly completed. Water is now run to the tanks in town. Mr. Reddy is still at the mine pushing on the work of development and getting the water works finished. Four or five carloads of ore are sent down from Cerro Gordo every week. The Dunphy-O'Keefe mine yields most of this. Good reports come from the Union mine and the expectation is strong of striking a large ore body speedily.

FROM SYLVANIA.—*Register*, Oct. 30: Water has been found in the Liheral shaft, and it interferes with work to such an extent that sinking has been suspended and crosscutting commenced. The Climax tunnel was driven 45 feet last week, and is now over 400 feet in length. Work on the shaft that was being sunk on the Climax mine has been suspended, and the force working there has resumed operations in the tunnel on Liberal ground in the hill just across the canyon, and northwest of the Liheral shaft. The ground in the tunnel indicates that the ledge is not far away.

MARBLE.—About 25 men are regularly employed at the Inyo marble works, four miles north of Keeler, getting out huge blocks of the white marble for the Mills building and the general market.

MINES, MARBLE AND SODA.—Bishop *Register*, Oct. 23: Sam Piper has opened up one of the richest gold ledges in this section. It is a mile or so north of Cottonwood creek, east of the Inyos and just within the Mono lines. He has also just got his new water-power arastra in operation. C. Wonacott has about finished the construction of a fine water-power double arastra on a stream near the old Sacramento mine for Joe Lopez. It is for the working of about 1000 tons of rather low-grade ores already on the dump near at hand. L. F. J. Winkle, superintendent, and B. F. Gray, assistant, are making a grand success of the soda enterprise. Its reduction works have within the year been more than doubled and processes improved upon, so that the big investment begins to pay a fair profit. The wet season has raised the lake a few feet, reducing the grade of the water from 8 to 10 degrees, but this has not perceptibly affected the output. The area of the vats is being constantly if not rapidly enlarged. In time there will be fully 1000 acres of these vats. All grades of the product are being shipped in increasing quantities, but more in the crude state than formerly for milling (silver), glass-making and other manufacturing purposes. About 25 men are regularly employed at the Inyo Marble Works, four miles north of Keeler, getting out huge blocks of the white marble for the Mills building and the general market. This important enterprise seems to be in quite a prosperous condition. Mr. Pidge, an experienced marble worker from Minnesota, is in charge of the quarry, with Al Staudenger as general assistant. The blocks go to the company's new mill on the Truckee for sawing and finishing for use.

Nevada.

IDAHO MINE.—*Tidings*, Nov. 1: Underground work in this mine has been temporarily suspended until the new pump rods are put in from the surface to the bottom of the mine. This is being done in preparation for the winter season, when the surface water gives the pumps more work to do. The depth of the mine causes a heavy strain up the long line of pump rods, and a general renewal of the timbers has been found to be necessary. No definite time has been set for resuming underground work, but the mill is kept going steadily, as there is a large supply of ore on hand.

THE OLD EAGLE BIRD.—*Tidings*, Oct. 26: The Diamond D., the old Eagle Bird mine in Washington district, now under the superintendence of H. C. Callahan, has a good record. The 30-stamp mill has been running continuously for two years, all the ore extracted being put through the batteries. What the net income is has not been given to the public, but the bars of bullion that are shipped monthly prove that dividends are of regular occurrence. Since the present owners have taken charge there have been numerous expensive improvements made in and around the mine. A road leading up the mountain to the Omega ridge and to connect with the Emigrant Gap road cost between $12,000 and $20,000. It is of great value to the mine, as it enables the owners to procure freight cheaply and expeditiously. It also opens up an extensive timber belt for use at the mine. A sawmill has also been erected, so that lumber and timbers are furnished to the mine for about $10 per thousand. The old compressor works have been moved down to the river, and a new compressor added. The shaft has been enlarged and made into double compartments, and extended down to the 600-foot level. A new hoisting works and building have been put up. A store has been built and stocked. A fine two-story residence is being constructed and is nearly completed. Cottages for employes have been built, and many other improvements have been made. Where labor-saving appliances can be used they have been supplied. The present owners bought the mine when it was reported as played out. But the past two years' run of 30 stamps has been made on ore then opened, and it will take four months yet to exhaust it. In the meantime explorations have been going on, so that the mill will be kept running on new supplies for an indefinite period. A mine that supplies 30 stamps continuously tells its own story.

San Bernardino.

TEMESCAL TIN MINES.—San Diego *Sun*, Nov. 1: Taking the principal tin mine, the Cajalco, as a central point, 700 feet northwesterly from the main shaft a well-defined vein of tin occurs; 75 feet southeasterly a strong line of croppings shows a promising vein of 325 feet in the same direction and the tin-bearing vein occurs, showing a long line of croppings which give high assays. Also in the same course three parallel veins are encountered, and at a distance of 600 feet the Little Scotty is seen with an incline shaft of 15 feet deep sunk on a rich body of ore. Samples of this ore show 20 per cent block tin, the vein showing an average width of 30 feet and is traceable for a long distance.

GOLD AND SILVER MINES.—About a mile from Temecula creek is a group of silver and gold mines, one of these showing a width of eight feet. From the ore exposed several samples were assayed with the following result: Silver, 165 ounces per ton; gold, $7.50; copper, 15 per cent.

Shasta.

THE PENROSE AND THE SCHERER MINES.—*Free Press*, Nov. 1: George Smith, with Mr. Parmlee of the reduction works, visited Penrose's mine at Gambler's gulch recently, and upon asking Mr. Smith for his opinion of the mine, he told us that it looked exceedingly well; that there is a fine-looking ledge 8 feet so far and not yet cut across; that the ore shows well, and from assays made is quite rich. P. Scherer has returned from San Francisco, where he has been to buy an air compressor, a Burleigh drill and other necessary machinery to work his tellurium mine. Pete says everything is looking well. The location of quartz mines in and around Shasta, and the working of many of them, is having a good effect on local business, and will improve.

Siskiyou.

THE OLIVE QUARTZ MINE.—Yreka *Sentinel*, Nov. 1: This mine, located at Indian Creek, near Hooperville, and owned by J. W. Smith & Co., is a well-developed lode and will probably prove a rich hooanza, says the Yreka *Journal*. The company has about 200 tons on the dump ready for crushing in its new mill to be put up next spring. They have run a 500-foot tunnel and found the ledge five feet thick, with prospects paying at the rate of $2000 to $3000 per ton. The Allen Bros., at Quartz valley, have been taking out some very rich quartz lately, paying from five to seven ounces of gold to the ton. The Spencer ledge, at Humbug, prospects well and the indications of a rich and permanent ledge are very flattering.

DOWN THE KLAMATH.—The Phil Mott claim is operated by seven partners, but without the success their efforts deserve. They are down to bedrock at a depth of 55 feet, and do not find very much gold—but they are working away and we wish them better luck in the future. There are a number of other river claims at this point and two miles up Empire creek is the Golden Age quartz mine. This mine has been worked at for a number of years, but this season they have been engaged in sinking a shaft, at the bottom of which there is a vein of particularly rich ore which is now being worked on. It is the intention of the owners to move their mill from the Klamath up to the mine, where its ten stamps will crush the ore in much quicker order than the area traction has heretofore done the work. The McConnell claim up river from Hoopa Valley is paying well, and the works here are the most extensive on the river. At the mouth of the Humbug the Spanglers are doing well although their wheels and other appliances were washed away last winter.

ABOUT HENLEY.—Gillam, Pane & Co. are building a house on their claim, and getting ready to commence work on their mine. Jillson & Co. have their mine in fine condition for working, and have already commenced to pipe and tear away the deep gravel. If the coming winter is favorable for water they will take out gold by the pound. The Black Jack Mining Co. will have about 100 tons of gravel hauled to Jacob & Coyle's mill next week, to be crushed. We have strangers with us almost every day looking at our mining interests, which shows that the locality is attracting the attention of mining men and capitalists.

Tuolumne.

HOMER DISTRICT.—*Index*, Oct. 27: The hullioo from the last cleanup of Clifton ore was worth $17 per ounce. There are but two or three idle men in camp. There ought to be a 30-stamp mill in Lake canyon. There is ore in sight to warrant the erection of such a plant. There are signs that something will happen in Homer district before a great many months have elapsed. In other words, Lundy will be a lively little camp.

NEVADA.

Washoe District.

CON. CAL. & VA.—*Territorial Enterprise*, Nov. 2: 1200 level: Continue the extraction of some milling ore along the line of the north drift. 1300 level: Ore of a fair quality is still being extracted from the junction with the upraise. 1500 level: Ore extraction continues on this level north and south from the upraise connection with the drift northwest from the old stopes. 1600 level: Have continued to extract ore along and above the line of the drift run east through the old stopes on the sill floor of this level. We are also working southerly from this drift stoping out ore. 1650 level: During the week we have taken out ore of the usual quality and quantity. North lateral drift from the Con. Va. shaft has been extended 216 feet. East crosscut has been extended to 77 feet connecting with the northwest drift from the C. & C. shaft. There has been extracted during the week from all parts of the mine 1596 tons of ore, which was shipped to the Eureka mill. Battery sample assays show an average value of $24 per ton; 1590 tons milled.

OPHIR.—On the 1300 level prospecting northwesterly from the winze, 108 feet below the sill floor of the 1300 level, has been suspended and, at a point 122 feet below that level, a west drift has been run 14 feet in low-grade quartz.

SIERRA NEVADA.—The southwest drift started on the 630 level has been advanced 62 feet in a soft porphyry formation showing some seepage of water.

UNION CON.—East crosscut No. 2 from the north lateral drift, 1465 level, extended 25 feet; total, 185 feet, ending in hard porphyry.

MEXICAN.—On the 1465 level the new winze has been sunk 15 feet during the week—total depth 80 feet. Bottom in hard porphyry and work suspended.

OCCIDENTAL CON.—The stopes on the 350, 400 and 450 levels are yielding 45 tons per day of fair-grade ore. The crosscut from the bottom of the winze at the 650 level is in 17 feet; formation, quartz and porphyry, showing some value. During the week the mill has worked 308 tons of ore of the average value of $21 per ton.

BELCHER NO. 1.—Usual amount of work done in various drifts and stopes. The top of the 300 stope still contains streaks of good ore. Shipped to the Vivian mill during the week 285 tons of ore, average battery assay of which was $25.67 per ton.

CROWN POINT.—Nothing new to report of the stopes. Shipped to the Mexican mill during the week 391 tons of ore, the average battery assay of which was $16.63 per ton. In Challenge Con., Seg. Belcher, Overman, and Con. Imperial, work of exploitation is being advanced as usual. Some fairly good ore is being developed in these mines, but none extracted or sent to mill.

GOULD & CURRY.—The northwest drift on the 200 level has been extended to 62 feet; formation, low-grade quartz. On the 400 level, from the old stopes have extracted 40 tons of ore. Car samples assay $23.50 per ton.

BEST & BELCHER.—On the 800 level the north drift has been cleaned out and repaired 140 feet; total distance 500 feet. West crosscut No. 2, 180 feet north of the south line, has been cleaned out and repaired 100 feet. On the 1200 level west crosscut No. 1, 45 feet above this level, has been extended 10 feet; total length, 122 feet; formation in face barren quartz.

ALTA.—Worked past week 315 tons of ore, the average battery assay of which was $19 a ton. The prospecting work in the raise above the 725 level looks well. The stopes on the 825 level are yielding as usual.

YELLOW JACKET.—Shipping 78 tons of $18 ore daily to the Brunswick mill, and doing extensive prospecting work throughout the mine.

ANDES.—During the past week good progress has been made in the north drift from west crosscut No. 1; formation, clay, quartz and porphyry. In the south drift from west crosscut No. 1, the usual progress has been made through quartz and porphyry.

SAVAGE.—Extracting ore from the 500, 600, 750 and 1300 levels. During the week have hoisted from these levels 757 cars of ore. Shipped to the Rock Point mill 385 tons and to the Mexican mill 500 tons; average battery assays, $20.35 per ton. Bullion on hand, $43,000. The southeast drift on the 1300 level advanced 22 feet, face in low-grade ore.

HALE & NORCROSS.—Usual progress reported in the several mine workings. Still repairing the incline and north compartment of the vertical shaft and will soon be able to run the incline machinery and resume work below the 1300 level.

CHOLLAR.—The raise from the 850 level is up 54 feet in hard porphyry. We are cutting out a chute at the 1300 level for prospecting purposes. The stopes are yielding the usual amount and quality of ore. Extracted and sent to mill 494 tons of ore; average battery assays, $18.06 a ton.

WARD COMBINATION SHAFT.—East drift from the 1800 station is out 640 feet; face in quartz and porphyry.

POTOSI.—East crosscut 160 feet north of the winze 1030 level is in 160 feet; face in quartz and porphyry giving low assays. The south drift from the winze station, 1130 level, is in 100 feet, face in bunches of ore. South drift from the main incline is out 560 feet; face in porphyry.

SILVER HILL.—Drifting on the 160 and 334 levels in hard porphyry.

KENTUCK.—The 1000 level east drift has been extended 10 feet; total length, 137 feet; face in porphyry. It is the intention to connect this drift with one now being run from Crown Point. Face of west drift on same level is in a mixture of clay and quartz. The south drift on the 950 level is out 11 feet in low-grade quartz.

JUSTICE.—Have started a north drift from the 822 level station to connect with the bottom 622 winze; face in hard rock. Face of north drift, 622 level, is in low-grade quartz. Face of north drift, 570 level, is in clay and porphyry. Shipped 168 tons of $22.46 ore during the week.

UTAH.—725 level—The main south drift has been extended to 713 feet; formation, porphyry.

CONFIDENCE.—General repairs throughout the mine preparatory to prospecting for ore are still going on.

KEYES.—Two new hoilers are being put in and the machinery arranged for active resumption of work in the mine.

SCORPION.—Southwest drift on the 600 level still running in porphyry with clay seams, showing no change.

ALPHA.—East crosscut, 600 level, is out 126 feet, face in quartz, giving fair assays.

EXCHEQUER.—Drifting and crosscutting on the 500 and 600 levels making good progress; faces in quartz, clay and porphyry.

CON. NEW YORK.—Drifts north of the 650, 800 and 1100 levels running in porphyry, except the latter, which shows a little poor quartz in its face.

Hawthorne District.

THE MOUNT DIABLO.—Walker Lake *Bulletin*, Oct. 29: Following is Supt. Shockley's weekly report of operations at the Mount Diablo: The east drift seventh level is in 295 feet. The east drift on sixth level is in 633 feet, and connected with the winze from the intermediate above. The main stope between fifth and sixth levels shows 3 feet of $60 ore. The east drift on fifth level is in 722 feet. The east stope on this level is giving considerable of $60 ore. The stope west of the shaft on this level is giving some $30 ore. The east drift on intermediate between fourth and fifth levels is in 73 feet, showing bunches of low-grade ore in the face. We have resumed driving the west drift on third level. The north crosscut on this level east is in 117 feet. The intermediate stope above the second level west is giving considerable of $50 ore. The north crosscut from this level east is in 45 feet. The intermediate drift between first and second levels east is in 262 feet. The stope on this level is giving considerable $40 ore. The west drift from Mount Diablo adit is in 96 feet. We are taking out considerable of $30 ore from the surface.

HOLMES MINE.—Nine bars of bullion, valued at $12,000, were shipped below yesterday from the Holmes mine, and four bars, valued at $5000, were shipped from the Mount Diablo mine. The Holmes Mining Co. paid out $35,500 in miners' wages on last month's account.

VARIOUS MINES.—Nat Norton is working a claim near Ed Willis' ranch, East Walker river, which promises well. He has an eight-inch vein of gold ore which averages $30 per ton. He has 14 tons extracted, which is now being worked in an arastra. We are informed that Martin Brazzanovich has discovered a ledge of copper ore varying from four to six feet wide, near Sodaville. The ore is reported to carry about 30 per cent copper and about $20 per ton silver. The demand for copper is steadily increasing and this mine is likely to prove of great value. G. C. Fish has a most encouraging prospect in the Ida mine at Garfield. He has been digging away into that district for three years and deserves a little streak of prosperity.

CANDELARIA'S PROSPECTS.—Col. Wm. J. Sutherland left for London during the week, after a flying visit to the mines under his control at Candelaria. He will arrive in England in time to attend the annual meeting of the Doris syndicate, but it is difficult to fix the date for his return. The Holmes and Princess mines are looking remarkably well just now, with more ore than can be handled with the present milling capacity. A fine new 40-stamp mill will be erected immediately, close to the town and directly below the Holmes mines. It will be as complete as money can make it in every particular. A fine body of ore is exposed in the Georgeoe mine, and a tunnel now being run from the Holmes into the Enterprise (a recent purchase has cut a ledge of high-grade ore, which leaves no doubt as to the value of the latter ground.

White Pine District.

NEW RATE ON ORE.—White Pine *News*, Nov. 1 The Southern Pacific Co. has issued a rate on ore, when actual value does not exceed $30 a ton, of $3.1 per ton from Elko to Ogden, when destined to Salt Lake City. Cars to be loaded to market capacity. This rate also applies to ore shipped from Gerald and Battle Mountain. J. B. Williamson received word yesterday that a rich strike has been made in the Chief of the Hill mine at Cherry creek. Silver ore assaying $500 to the ton has just been struck in one of the company's mines at Ione, Nye county.

ARIZONA.

AROUND GLOBE.—*Silver Belt*, Nov. 1: Work on the copper and silver mines of Globe district is being energetically prosecuted. New silver claims are being prospected and the production of silver increased. The outlook is certainly encouraging and there is growing activity in every other industry, which, after all, are dependent upon the prosperity of our mines. The Quartet M. Co. is meeting with excellent success in the operation of its mine and mill. The mill has been running on custom ore and the result in every instance has been satisfactory to the owners of the ore. Ore from the Co.'s mine, the Loco, is now being worked, and a bar of bullion was shipped this week, and the company expects to make regular weekly shipments in the future. An important strike was made in the Loco last week, the ore assaying from $100 to $350 in silver per ton. The Loco promises to develop into one of the best silver mines in Globe district.

TURQUOISE DISTRICT.—Tombstone *Prospector*, Nov. 1: Si Bryant returned from El Paso yesterday, where he went with three carloads of ore from his Turquoise mine. One carload was sampled and returned him $2136 after paying freight and working charges. This exceeded his most sanguine expectations by $15 per ton. The cave recently struck in his mine is said to be a grand sight, and the beauty of it is that it shows up hundreds of tons of ore like the sample spoken of.

BRADSHAW DISTRICT.—Prescott *Courier*, Oct. 29: Messrs. Jackson, Marx and Carnes, just from Bradshaw district, give good reports of mills and mines. There are 110 men at work building a wagon-road from Phœnix. The Venetian mine, an extension of the Crook, is paying handsomely.

BRITISH COLUMBIA.

HOT SPRINGS.—Nelson *Miner*, Oct. 18: From this district little of interest is reported, other than that difficulty is encountered in procuring animals to pack shipping ore from the mines to the landing at Ainsworth, the owners of pack-trains refusing to do the work at the rates offered. Dr. Campbell, manager of the Revelstoke Mining Co., is now the ground making preparations for carrying on work at the United and No. 1 during the winter. The wagon-road will be extended from the Krao to the United, a distance of half a mile, so that ore can be hauled to the landing for transhipment to Revelstoke in the spring. A suitable ore-shed will be erected at the landing, if terms can be arranged with the owners of the townsite. On the United, a station will be put in at a depth of 50 feet, and a drift run on the ledge in both directions. If this is done the water can probably be handled this winter without the aid of machinery. The Best smelter was to have made its first trial run on Friday. A test was made the fore part of the week on a small quantity of picked specimens, the result being in every way satisfactory. The delay in making the trial run is said to have been occasioned by the refusal of the owner of the pack-train at Ainsworth to pack ore at the price offered, and by the refusal of prominent claim-owners to furnish ore.

TRAIL CREEK.—From this locality news comes in a roundabout way that a Mr. Dwyer, who visited the camp to make an expert report for Seattle parties, says its ore bodies are equal, if not far ahead, in quality to those in Toad Mountain and Hot Springs districts. From a 500-pound sample he had assays of $147 in gold. There is said to be much activity in the camp, and miners are making quite extensive preparations for the winter.

ON GOAT RIVER, ROVER AND EAGLE CREEKS. The more work done in Goat River district the better the showings. Among the owners in its prospective bonanzas are Jap King, Capt. Hayward, J. C. Rykert Jr., George Francis, Thomas Shearer, George Barnes, Dr. La Bau and the Petty brothers. On Rover creek the owners of the Whitewater are more than jubilant; they are millionaires. They claim to have one of the richest properties in Toad Mountain district; and if many tons of ore are in sight as good as the specimens on exhibition at Nelson, their claims are based on a pretty solid foundation. The free gold is found in rose quartz and in oxides of iron, the sulphuret ore being but a small percentage of the total. Recent assays by Ellis of Nelson gave $204 in gold and $24 in silver to the ton. The ledge is from 2 to 6 feet in width. A prospecting mill will, without doubt, be placed on the property at an early date. On Eagle creek work is reported entirely suspended at the Poorman, owing to a scarcity of water. The Wild Cat, Keefer & McCrea's promising prospect, is looking way up, and way-up figures would have to be offered for it by intending purchasers. The Chicese placer-miners on Bird and Jay creeks are taking out good pay, as is proved by the amount of dust sold to their "tyhee" in Nelson.

DISCOVERY OF PLACERS NEAR PASCO.—Okana-

gan *Outlook*, Oct. 17: A dispatch from Pasco dated Oct. 6th says: Intense excitement prevails among residents of this city over the discovery of placer mines three miles from town on the Columbia river. The mines turn out gold at the rate of from 2 to 5 cents a pan, and old miners assert that they can do better. A company is being organized to-night and the work of development will be pushed rapidly. Over 20 claims have already been taken, and it is expected that 200 will be taken by to-morrow evening. People are leaving town to-night to locate upon claims. Assayer Larkin pronounces the gold of the finest quality.

CLOSED DOWN. — The superintendent of the Arlington mine received instructions Monday to close down the mine. The why and wherefore of this termination of operations deponent knoweth not, but it is in harmony with previous manifestations of eccentricity on the part of the company, and creates not a particle of surprise and very little comment from those familiar with its history.

COLORADO.

ASPEN MINES.—Aspen *Times*, Oct. 26: The mining outlook in the Tourtelotte park was never as bright as it is to-day. At all points the old mines are looking well, and a number of new strikes have been made recently that are of the greatest importance. That section is producing steadily and heavily, and there is every prospect that this will be continued indefinitely. To give an idea of the condition of the industry there, the following resume of the more important features is given.

GOOD THUNDER.—A big strike has been made in the Murphy lease on the Good Thunder.

EDISON NO. 2.—In the central section of the Edison, known as the Edison No. 2, a large body of ore is showing.

THE JESSIE.—Some weeks ago Thomas Ogburn concluded to do some prospecting on the Jessie and started a drift off south from the tunnel. This at a distance of 50 feet has passed into a genuine ore chute that is a wonder. There is ore everywhere and no sign of a wall on either side. The ore is heavy in lead and rich in silver.

STRIKE IN CONUNDRUM.—Word was brought down yesterday of a big strike in the Conundrum. This has been made in the Vulcan tunnel on the Grand Union Group owned by Captain S. Q. Carey, A. J. Pickerell, Thos. Ogburn, and others. The discovery of rich ore in this property is not a surprise, but it has been found in an unexpected quarter. The mineral averages up close to 100 ounces and there is ore everywhere in the works.

THE O. K.—This mine is now in far better shape than it has been at any previous time.

LAST DOLLAR.—The Dollar long ago made its reputation, but this is being added to by recent developments. The property is increasing in value all the time and is one of the big things of the State.

HIGH GRADE ORES.—Georgetown *Courier*, Oct. 25: Phil Sheridan had a test millrun from the Ben Harrison lode Thursday, which returned 240 ozs. silver. The ore also carries quite a large per cent of lead. John Frazier is stoping on a small vein of good ore on his Black Prince, which according to a millrun had this week returned 242 ozs. silver to the ton. Silas Durkee & Co. have a vein of solid ore 12 inches thick in their working on the Johnson. A millrun of seven tons had this week returned $95 to the ton.

DAKOTA.

MINE AND MILL.—Deadwood *Pioneer*, Oct. 31: All the men and teams engaged in breaking ore at the Golden Reward and hauling it to the reduction works, were laid off yesterday, there being a sufficient quantity of ore to last until spring. A rich strike has been made in the Gold Bank mine at Mineral Hill, some of the ore assaying $3000 per ton. The vein is a fissure running down through the porphyry, and carries free gold. The rich streak is in the center of the vein and is only a few inches wide, but the rock on either side for a distance of four feet runs heavy in gold. Titus Corkhill brought over two specimens last night that under a glass were alive with free gold. The find has created great excitement among the miners of Bear Gulch. A force of men is at work on the Maggie mine at Ruby, taking out a high grade quality of ore. Joseph Swift, on his recent visit to the mine, expressed his satisfaction at the showing made. The Double Standard is shipping ore daily to Omaha over the B. H. & Ft. P. R. R. A carload is gotten out every two days, and the grade of ore is about $50 per ton.

IDAHO.

KOOTENAY COUNTY.—Boise *Statesman*, Oct. 26: Among the many excellent mining claims in Granite creek district, Kootenay county, may be mentioned the Montana, Idaho and Nevada. The veins are large and well defined on the surface, and as depth is attained the veins are widening. A large force of men has been kept constantly at work for several months, and as a result, the vein will average from 7 to 9 feet in width of silver-lead ore which assays from 150 to 350 ounces in silver per ton, 35 to 40 per cent in lead. These three are the best developed claims in that district, and every shot put in has demonstrated the greater value of the claims.

CŒUR D'ALENE.—Wardner *News*, Nov. 1: Work is being pushed vigorously throughout all portions of the Cœur d'Alene country. The developments made during the past season in the Poorman mine, place that property on a par with the best ore-producing mines in the country. The best evidence of its value can be found in the words of its superintendent, Mr. P. Clark, who says he will produce $70,000 in lead and silver this month, and pay a handsome dividend as well as $3.50 per day to a force of over 200 men.

LALANDE DISTRICT.—A rich strike was lately made in the Hunter mine, a large body of ore being encountered in tunnel No. 4. The ledge is 18 feet wide of good concentrating galena ore. Lalande district is daily adding to its reputation; many new producers will be added to the list in the near future, as some of the shafts now being sunk cannot fail to open up large bodies of ore.

YREKA DISTRICT.—The Last Chance Mining Co. on last Monday commenced excavating preparatory to starting their long tunnel which is intended to tap the lode at a depth of 900 feet from the surface and about 420 feet below the present workings. This tunnel when finished will be 2600 feet long, 7 feet high and 10 feet wide; it will contain double tracks allowing cars to pass each other, thus avoiding all delay in getting out the broken material. Supt. Charles Sweeny expects to have this mammoth work completed in 12 months. The company has 85 men on its present pay-roll, 65 of the number being employed in the mine and mill and 20 on the tunnel. The concentrator is running day and night.

LOWER CALIFORNIA.

IRON MINES.—*Lower Californian*, Oct. 23: M. D. King, superintendent of the Tepustete iron mines at San Isidro, says that the mines are among the largest on the continent. He has spent the last few months thoroughly prospecting the property, as the company wished to understand the full extent of its possessions before expending the large sums necessary to develop them. Mr. King thinks that it is the most valuable property on the Peoinsula of such a character.

THE SUENYO MINE.—D. M. Smith, late of Alamo, has secured a large interest in the rich Suenyo mine south of Tia Juana. A large force of men will be put at work developing the property.

MONTANA.

NEW SMELTING WORKS.—*Mining Review*, Oct. 29: The Helena smelter started up last week with over 100 men and ore enough to run two furnaces. It was expected that another furnace would have been started this week, but the accident on the Boulder branch of the Northern Pacific prevented the delivery of ore engaged, and the firing of the furnace will necessarily be postponed until trains can pass over this line. The smelter people hope soon to have the works running at their fullest capacity, when over 200 men will be employed, and 200 tons of ore reduced daily. In the Bald Butte, near Marysville, it is reported that a six-foot vein of free-milling gold ore has been discovered in the new shaft. The mill is in constant operation, and the returns large. The quartz claim of Messrs. Hunter and Fisher, located on Ogden mountain, near Helmville, has developed some very fine ore, and is now considered one of the best properties in that section.

STILL PROSPEROUS.—The Butte *Inter-Mountain*, Nov. 1, says: There has been no break in the prosperity of this camp during the past week. The steady advance of the year has been maintained and almost every day has chronicled its new improvements or a strike of more or less value in some of the many great properties making up the district.

IMMENSE IF TRUE.—Montana *Journal*, Oct. 29: It is said that the Cumberland, at Castle, has, by actual measurement, 450,000 tons of ore in sight, of an estimated net value of $50 per ton. Were the Cumberland in Leadville its stock would be quoted at $10 per share. In Montana it is a slow seller at $3.50.

NEW MEXICO.

ABOUT SILVER CITY.—*Sentinel*, Oct. 28: It is authoritatively stated that the contract has been let for a 100-ton concentrator to be erected at San Pedro at once by the Santa Fe Copper Co. Sec'y Thomas has let the contract for $3000 worth of improvements on the old Government palace at Santa Fe. We are informed by Lawrence Ryan that the Kinney Bros. have struck another bonanza on one of their claims joining the Log Cabin on the west, which looks better than any heretofore struck in that section. They are now down 30 feet, being in ore almost from the surface. Some of it samples 6000 ounces in silver and $500 in gold. The strike is in a lime formation, the ore being in quartz and talc, full of chlorides and sulphides.

SOUTH DAKOTA.

ONTARIO.—Deadwood *Pioneer*, Oct. 26: John Gerkins, who came over from Galena, Wednesday, reports everything progressing smoothly at the Ontario. As the main tunnel progresses the ore becomes richer, and they now have a good body of gray carbonate that will go 30 per cent lead and 60 ounces in silver.

GOLDEN REWARD. — The Golden Reward has upward of 2500 tons of ore at the reduction works, and is daily adding to the pile. The chlorination process is proving a decided success.

UTAH.

STRIKE IN THE MORMON CHIEF.—*Tribune*, Oct. 29: A few days ago the *Tribune* told of a body of quartz having been struck in the shaft of the Mormon Chief out at Tiotic. Now comes the good news that on Tuesday a body of galena was tapped below this quartz, but it is not known to what extent. This gives promise of making the Mormon Chief a big property in the near future.

A GOOD CLAIM.—The Dewdrop has a 16-inch vein of ore that assays 60 ounces in silver and 40 per cent lead. It is a promising claim and is in a splendid locality.

OZOKERITE.—Yesterday a party of gentlemen were busy organizing a company to develop mineral wax deposits in the Castle Valley country, and also engage in manufacturing this wax into paraffine, etc., the factory to be located in this city.

FINE ORE.—The *Tribune* was yesterday shown an assay of ore from the Copper Queen, near North Ogden, which was 3.4 ounces silver and 6.6 ounces gold, a total value of $132 per ton. This is a new and promising prospect, owned by Hutchinson & Noah. It has a 40-foot tunnel, and the face shows eight feet of ore.

A RICH STRIKE is reported in the Sampson at Bingham, adjoining the Yosemite.

THE DEEP CREEK COUNTRY.—*S. E. Journal*, Oct. 29: A great many prospecting parties have been sent out into the Deep Creek country by our business men. If all are successful, a great deal of wealth will be added to Zion, as the fine, large blocks that adorn our streets are, as a general rule, the results of mining ventures.

AMERICAN FORK.—Mining matters are beginning to brighten up in the vicinity of American Fork. When the mines up the canyon begin heavy shipments again, it will be necessary to rebuild the railroad that once furnished transportation to the famous Miller and other American Fork canyon mines.

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	*$38,227	$.....
Alpha	24,959	.....
Andes	14,707	.....
Bodie Con	112,507	.....
Benton Con	80,000	.....
Belcher	‡29,785	.....
Belle Isle	.....	16,293
Best & Belcher	19,392	.....
Bulwer	3,409	.....
Bullion	6,883	.....
Challenge Con	2,441	.....
Caledonia	5,092	.....
Chollar	.....	112,783
Con. Cal. & Virginia	*5,027	.....
Confidence	.....	8,462
Con. Imperial	.....	*35,664
Con. New York	2,889	.....
Commonwealth	16,847	.....
Crocker	6,869	.....
Crown Point	.....	18,825
Del Monte	.....	12 370
East Sierra Nevada	2,334	.....
Eureka	.....	‡20,842
Exchequer	13,265	.....
Gould & Curry	25,833	.....
Grand Prize	.....	11,433
Hale & Norcross	.....	*34,168
Holmes	.....	‡31,005
Independence	2,872	.....
Julia	4,821	.....
Justice	‡12,218	.....
Kentuck	.....	.....
Lady Washington	10,921	.....
Locomotive	1,404	.....
North Bello Isle	.....	††28,851
North Commonwealth	1,048	.....
Mexican	*1,341	.....
Mono	15,892	.....
Navajo	.....	18,875
Nevada Queen	.....	.....
Occidental	‡8 004	.....
Ophir	28,919	.....
Overman	‡68,784	.....
Peer	6,5 6	.....
Peerless	10,210	.....
Potosi	.....	26,300
Savage	.....	‡4,211
Scorpion	2,783	.....
Seg. Belcher & Mides	*11,493	.....
Silver Hill	*2,977	.....
Sierra Nevada	18,603	.....
Silver King	*249	.....
Standard	.....	‡3,888
St Louis	.....	.....
Syndicate	3,972	.....
Union Con	11,103	.....
Utah	9,932	.....
Weldon	7,225	.....

* Collecting assessment.
† Bullion $15,532 not included.
‡ Mines expenses and bullion returns not included.
†† Overdraft at bank $134,059, unsold bullion $326,254. Mine expenses and more bullion shipments to be heard from.
†† Bullion to arrive will cancel indebtedness and leave a cash balance.

Mining Share Market.

Mining shares the past week ruled dull on Friday and Saturday, but on Monday opened strong and higher under the leadership of the middle stocks—Potosi scoring an advance of $1.75 a share. Since then prices have hung around at a slight decline. The dull trading and hanging of prices cause many well-informed operators to look for a sharp set-back before another up move is made. The decline will be made to uncover margin stocks. Reliable advices from the mines do not warrant lower prices but everything to encourage the belief that better prices will prevail. The mill ring appears to be fighting against higher prices, and also against any movement calculated to bring about a reform in mine management. In outside shares the Tuscaroras and Quijotoas ruled extremely dull at blackboard prices; but the Bodies shaded off and that, too, in the face of the best of advices from the Bodie and Standard mines. Mt. Diablo and Eureka have held fairly steady.

A telegraphic report came to hand from Carson City that the Comstock Tunnel Co. had agreed to place the royalty on ore to four per cent of the bullion yield. As the tunnel property is in litigation, this goes for naught until the courts decide which company—the Sutro Tunnel Co. or Comstock Tunnel Co.—are owners of the property. But, not taking the ownership into consideration, four per cent royalty is a reduction on all ore going below $50 a ton, but an advance on all going above that figure. If the present royalty was cut just half in two, the rate would give much better satisfaction.

When the Billy Brown party surrendered the control of the Andes Mining Co. there was over $17,500 in treasury. On Nov. 4th the company reports a little over $14,500 in hand, a decrease of about $3000 in less than a fortnight, and no more men at work. At that rate, the company will get away with fully $75,000 a year.

The market opened this (Thursday) morning dull and weak under a report of lower prices. After Call, prices shaded off some, but toward noon they showed a better tone. In outside stocks, Bodie sold down to $1.75. Those in position to know affirm that strong buyers have been taking Bodie and Mono during the late decline.

News from the Comstocks report an important development in Potosi, causing a more hopeful feeling among insiders. The development is both north and south of the winze. Advices from other Middle mines are of a very cheerful character. From the Gold Hill mines important work is going on and good results are looked for any day, particularly if the manipulators corner the stock market. From the North End Mines our advices are of a very encouraging character, but more deadwork is necessary. In West Con. Virginia they are prospecting the upper levels, while preparing to sink the shaft to the 800-foot level, so as to tap the ore body tapped in the west workings of Con. Virginia. In the Alta group good results are expected from the prospecting work now under way.

From the outside mines our advices are of the same favorable character heretofore made public regarding the Tuscaroras and Quijotoas. Dividends are expected to be paid by one or more of the Tuscarora mines at an early date. From Bodie our advices are of a still more favorable character and do not warrant the break in prices. The work indicates close proximity to one of the rich pockets for which that mine is noted. The battery assays of the ore milled in about $50 a ton. It is said that the next bullion shipment will be considerably larger than the last. The news from the Standard mine reports very important work going on.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCT. 28, 1890.

439,469.—CULTIVATOR — H. S. Brink, Biggs, Cal.

439,321.—MACHINE FOR CUTTING BOARDS—J. B. Burrell, Wrights, Cal.

439,110.—TRANSMITTING POWER — E. Chaffey, Santa Monica, Cal.

439,148.—PUMP VALVE — L. Dahlstrom, Santa Clara, Cal.

439,140.—CLUTCH PULLEY—J. C. Gibson, S. F.

439,503 —BURGLAR ALARM— J. J. Grillith, San Bernardino, Cal.

439,403.—SEAT BACK—S. C. Houghton, S. F.

439,299.—CUFF-HOLDER—A. A. Lomont, Santa Rosa, Cal.

439,250.—CLOTHES-PIN—G. W. McCord, Baker City, Ogn.

439,421.—AIR SHIP—P. W. Nahl. S. F.

439,325.—VEHICLE SEAT—D. F. Oliver, Oakland, Cal.

439,550.—LEAF-TURNER—J. E. Pellow, Sierra City, Cal.

439,224.—SHINGLE MACHINE—D. W. Williams, Fortuna, Cal.

439,336.—COMBINATION TOOL—Geo. Zitlow, Tacoma, Wash.

The following brief list by telegraph, for Nov. 4, will appear more complete on receipt of mail advices:

California—William H. Anderson, Riverside, treadle pump; John W. Crites, S. F., mining; Owen T. Davies, Brighton, combined ditcher and cultivator; James B. Dean, Lompoc, and H. H. Earl, S. F., brush attachment for dustpans; Adolf Fritsch, Suisun, cigar or cigarette-holder; Louis Gottstone, S. F., street or station indicator; Charles D. Kennedy, California City, machine for making shells; William A. J. Kohrn, S. F., telegraph key; William Maybury, Pasadena, apparatus for drying, bleaching and washing yarn; Horace D. Ranlett and G. Provost, S. F., device for operating shutters for elevator shafts; James W. Reid, S. F., discharge attachment for wash basins, etc.; Percy W. Rose, Los Angeles, car-coupling; Frank Sharon, S. F., hose-coupling; Joseph L. Stillman, Fresno, car-coupling; John Taggart, San Diego, rubber-shoe attachment; Ludwig Wagner, S. F., wine schooner; Alfred M. Whiteley, Sacramento, attachment for chairs; William H. Wiester, S. F., waterback for gas stoves.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

VEHICLE SEAT.—D. F. Oliver, Oakland, Cal., assignor to Truman, Hooker & Co. of San Francisco. No. 439,325. Dated Oct. 28, 1890. This invention belongs to that class in which the seat is pivoted at one end, and is adapted to be turned into a horizontal plane from a position for use to a position out of the way to enable a person to readily enter the vehicle. The invention consists in a novel, simple and effective construction of the pivot joint of the seat, whereby it is readily operated, is locked in either an open or closed position, and is fully supported during its turning.

CLUTCH PULLEY.—James C. Gibson, S. F. No. 439,140. Dated Oct. 28, 1890. This invention is an improvement in belt pulleys for driving machinery. The pulley consists of a rim without a central hub, means for connecting said rim with the driving shaft or disconnecting it therefrom, so that it will remain stationary, and means for supporting said rim when disconnected from the driving shaft. More particularly speaking, the pulley consists in connection with a rotary shaft having a hub secured to it, radial guides from said hub, arms sliding radially in the guides, levers fulcrumed to the hub, and having one end connected with the sliding arms and the opposite end connected with the clutch sleeve, a means for moving the sleeve longitudinally on the shaft so as to actuate the levers and arms, and clamping segments fixed to the outer ends of the arms, said segments being adapted to clamp an interior flange on the pulley rim so as to unite the rim with the central hub and cause it to be driven thereby.

ADJUSTABLE SEAT-BACK.—Stephen C. Houghton, S. F., assignor of one-half to D. C. Branch of same place. No. 439,403. Dated Oct. 28, 1890. This invention, though applicable to any chair or seat requiring an adjustable back, is particularly designed for use in connection with piano stools. The invention consists essentially of a back connected with the stool by a hinge joint, and a thumbscrew and nut whereby the back may be turned upon its joint to be accurately adjusted to and held securely at any inclination desired. The back can be readily connected with and disconnected from any stool, and its inclination easily and accurately determined and securely maintained.

FRUIT-DIPPING APPARATUS.—David D. Jones, San Jose, Cal., assignor to W. C. Anderson of same place. No. 439,072. Dated Oct. 21, 1890. This apparatus is intended for the dipping of prunes, first into lye water and then into clear water, previous to drying. It consists of two tanks, one for the lye water and the other for the clear water. In each is a swinging dipper having a foraminous bottom, and these dippers operate alternately, the first discharging its contents into the second and the latter discharging the fruit upon a vibrating tray upon which the prunes spread themselves evenly and so which they are carried off to dry, a fresh tray being substituted.

MECHANICAL PROGRESS

Mechanical Evolution.

The term evolution is nowadays employed to denote a slow, progressive unfolding, or growth, and describes in a very complete way the history of all important machines and processes in industrial development. This evolution is not an ideal matter; on the contrary, it is a business one that must be taken into account the same as taxes or an expense account. Every improvement of any importance comes down to a standard of "common practice" through a course of evolution.

At the present time we are busy with steam expansion; double, triple and quadruple engines with high boiler pressure. If one looks back for half a century, the evolution of this matter assumes a tolerably regular sequence, not so much of discovery as adaptation. It is a quarter of a century since Perkins began his experiments with high-pressure steam. Wolff, much farther back, introduced the second cylinder. Sixty years ago regular compound engines were made and fitted into steamers in Holland. The drawings of these engines have recently been reproduced in England and published in the *Engineer*.

On the Ohio river 40 years ago there were compound engines. The Hawkeye that was sunk about 1848, by her flywheel breaking, had compound engines. The Clippers No. 1 and No. 2, lasting from 1846 to 1856, had compound engines, set tandem; so had the Memphis, a New Orleans and Cincinnati packet, 35 years ago. Her engines were about 16 and 24 inch bore, the cylinders set tandem. They were called then Clipper engines, from the name of the first boat fitted up in this manner on Western waters, and were in all essential respects the same as compound engines are now made. The pressure employed was nominally 150 pounds per inch, when the "chief" did not hang too much weight on the safety-valve. In that case the pressure was uncertain and rose rapidly if an opposition boat was seen ahead.

It is more than 15 years since John Elder of Glasgow was in the heat of battle with his competitors over the compound-engine problem, and it is ten years or more since Mr. Galloway of Manchester, England, constructed a quadruple-expanding engine for a cotton-mill there, and was laughed at for committing such a vagary. The rule of "evolution" in such things is inexorable. There is no escape from it except on the principle of "proceeding in haste and repenting at leisure."

Mr. A. S. Hallidie's first cable railway in San Francisco was constructed in 1873, seventeen years ago. Since then there has been concentrated on this subject the best efforts of our ablest engineers, spurred on by the incentive of a great public want and ample facilities. Now at the end of this time we find ourselves changing, modifying and improving with scarcely one feature or detail settled in a definite way. A new type of cars is just being tried, a new system of turn-tables has been adopted, the traction gearing is widely varied, the cable conduits are taking various forms, and little of the old appliances remain. We can see many years more of evolution before the cable system of propulsion assumes what is called standard practice.

Some of our older mechanics can remember something of the evolution of so simple a thing as the monkey-wrench or "screw-key" or "screw-spanner" as it is called in England. This very useful implement came into use about 40 years ago and met with wide acceptance, but no one knew how to make such things at a reasonable cost with the strength required to withstand rough use. The monkey-wrench, after a successful career of a few years, came very near passing out into oblivion again, and deserved to, for, as a steamboat engineer once remarked, "he did not dare leave port without a box of them." The Coes, at Worcester, Mass., saved this implement by commencing its manufacture in an honest manner, substituting wrought and malleable for cast iron, and otherwise making it a strong, convenient tool. The period of evolution was 20 years or so for this little implement.

The constructing engineer who has "come to older years," as the great Vasa called it, makes constant use of the evolution theory as it applies to arts and manufactures. The margin allowed cannot be computed with certainty, but must be estimated in some way. The sanguine inventor ignores the whole matter; so too does the sanguine investor sometimes. The college man thinks the theory of evolution a rebuke to computed results, but evolution keeps on in its quiet course demanding its proportion of time, effort and loss.

We derived some pleasure once in tracing the evolution of a peculiar kind of boats employed by the Scandinavian fishermen in the North sea. These boats with their rigging have come down through at least a thousand years of experiment, and one can find no detail of them that is a result of modern inference or invention. Old men can remember when a few things were different, but not much, from present methods. Those in the Skargord (rock garden), as the middle Swedish coast is called, are of wide beam, very strongly built, on the clincher system. The keel is very deep in the center and is no longer than the beam, is in effect a fixed center-board. The boats are always rigged so as to carry a strong "weather helm," and will turn as though on a pivot. The cause of this is traceable to the granite crags that are everywhere beneath the surface of the water. A helmsman has to see these in the clear water and turn within a boat's length to miss them. Provision for meeting the sudden squalls that come out of the gorges and canyons is seen in the methods of rigging these boats; in fact, every novel feature can be traced to some circumstance of peculiar use, which no one of our day, or any other day, invented at one time or without a train of experiments.

Going north or south, one finds the fishing craft modified to meet the circumstances. On the Norwegian Coast the boats are quite different—sharp at both ends and with a great deal of "sheer." To the south the boats are larger as the sound grows wider; lug sails are used and the timbers are not so heavy. One will inquire in vain from the builders of these boats the reason for models, arrangement, or other feature of them. As before remarked, they came from the Viking period; perhaps long before.

The blacksmiths' anvil is another case of evolution. No one of our day can remember much change in this implement. The Tyrians, no doubt, began the development, and down through ages the "survival of the fittest" pointed out the most convenient form. The overhang, the horn, rehate, and swage socket grew by use.—*Industry*.

TEMPERING IN OIL KNOWN TO THE ANCIENTS. The fact that tempering iron in oil was practiced by the ancients is mentioned by Pliny. We also learn from Shakespeare (Bacon?) that the Moors possessed the knowledge of tempering by water at different temperatures if not by different liquids, for he makes Othello say: "I have another weapon in this chamber; it is a sword of Spain, of the ice-brook's temper." Also, Homer in his "Odyssey" says: "As when the smith dips into cold water a great ax or an adze, and it hisses lordly as he is tempering it, for so it is that iron is made hard." Mr. James Riley of the British Iron Institute, in a paper read at the meeting of May, 1889, on the subject of the alloys of steel and nickel, said that continuous research was being made into the matter of tempering iron and steel, and that although the treatment of large masses of steel by tempering, hardening and annealing has been carefully studied for years, still the secret of the behavior of such large masses under such conditions is yet far from being unfolded.

TERNE PLATES AND THEIR ORIGIN.—Charles Thaner, a veteran St. Louis tin roofer, inspector of "terne plates," recently said: "I think they really originated in this country and not in Great Britain, as is popularly supposed. There used to be an old roofer around here who insisted that terne plates were made East more than 50 years ago. I have also seen a published account somewhere of an experiment in Philadelphia with roofing tin, now known as terne, as early as 1830. It was made by hand, and by dipping a sheet of bright tin into a bath of molten lead. Some time afterward the idea of a terne-coated plate was adopted by the Welsh manufacturers, and it was still later that machinery was introduced by them in turning out terne plates. So you see the idea was American, even if carried out by foreign manufacturers. I see the old story of using ternes to make cans is up again. No canner would want heavy coated plates in preference to bright tin. There's nothing in the story, probably; but it comes up every now and then."

CASE HARDENING IRON BY ELECTRICITY.—The old method of case hardening iron, or converting its surface into steel, is done by inclosing the iron in a close iron box with a quantity of burnt leather scraps, honedust, or any other material containing carbon, and subjecting the box for some time to a red heat. The surface of the iron so treated becomes carbonized—converted into steel—and is then susceptible of receiving the finest steel polish. It is said that Prof. Elihu Thompson is credited with a method of performing this work by means of the heat produced by the passage of an electric current. *His* process consists essentially in heating the object electrically, and then applying to the metal so heated a surrounding envelope — either gaseous, fluid or solid—for the purpose of changing or preventing change in the quality of the material, according to the special end to be attained.

TO DETECT FLAWS IN METALS.—We recently referred to a new device called the "echiseophone," used to detect flaws in metals. The instrument is now described by *Nature* as follows: "It consists of a microphone combined with a mechanical striker and a sonometer. In using the instrument one operator directs the striker over the surface of the metal under examination, while another listens at the telephone in an adjoining room. When the striker hits a point over a flaw, the sound is increased, and the increase is so magnified by the microphone that the listener at the telephone can detect its presence. Tests of the instrument were made at Ermont on the rails for the Northern Railway Co., and in every case where a flaw was indicated by the instrument it was found to exist on breaking the rail."

BOSTON is about to try the virtues of fuel gas. The Boston Gas Company, at the North End station, have a plant embodying the latest improvements in the production of water-gas from the cheapest grade of fuel.

SCIENTIFIC PROGRESS.

A Liquid, Volatile Nickel Compound.

Nickel seems destined to startle the world in more senses than one. Its influence as an alloy in steel for ironclads is just now the talk of the mechanical world. Almost simultaneously with the announcement of this remarkable influence of the hitherto little used nickel comes a new sensation which has startled the chemical world also. The *Scientific American* says:

From being a comparative rarity, except on plated goods, it (nickel) became a common laboratory material but a little while ago, then its title to be considered an element was impugned, and now it is both triumphantly reinstated and its vapor density, for the first time, determined. These results have followed from the researches of Mr. Mond and Dra. Quincke and Langer, which were recently made the subject of a paper before the Chemical Society. The investigation owed its origin to the need for removing carbonic oxide from producer gas, in order to use it in the gas battery described in Mr. Mond's presidential address at the annual meeting of the Society of Chemical Industry last year, nickel and cobalt being found to effect this object.

Working in this direction, it has been found that a direct compound of nickel and carbonic oxide, viz., $Ni(CO)^4$, exists, the new substance being a colorless liquid, volatile at ordinary temperatures, boiling at 43° C., having a specific gravity of 3.3185 at 17° C., soluble in alcohol, benzine and chloroform, and not acted upon by dilute acids and alkalies. Its vapor explodes when heated to 60° C. Its vapor density determined by Victor Meyer's method is 6.01, instead of the theoretical value, 5.09; from this, the atomic weight of nickel is found to be 58. The metal itself can be obtained from it in the form of brilliant metallic mirrors of such purity as to form a splendid raw material for the redetermination of the atomic weight. The mean value obtained by reducing nickel oxide from this source by heating in a stream of electrolytic hydrogen was 58.61, corresponding closely with that previously accepted, viz., 58.52. This proves conclusively that Kruss and Schmidt's assertion that the metal hitherto considered to be pure nickel is contaminated with another element, and that all date concerning it consequently need revision, cannot be sustained, and replaces nickel as we have always known it among the elements.

The constitution of the compound $Ni(CO)^4$ is still the subject of the keenest speculation. Mr. Mond declined to be "drawn" on this point, admitting the temptation to represent it by some fascinating ring formula, but contenting himself with a statement of the facts. In connection with this curious body, it is to be noted that no similar cobalt can be obtained, thus establishing another method of differentiation and separation between it and its twin brother nickel.

SCIENTIFIC AND PRACTICAL KNOWLEDGE.—All knowledge is comprised in two classes. The first is that effort of mind which is the result of curiosity; that species of human instinct which prompts us to inquire the reason why everything we see, every action which takes place among others, among all living beings, among the elements, and among the celestial bodies. Mankind being endowed with reason, the next impulse is to apply the knowledge so gained to some useful purpose, to produce some benefit to ourselves. The first of these two classes is called "scientific investigation," the second is called "applied science." For instance, we notice for the first time a light from which smoke arises; we investigate, we perceive heat, and that it produces a disagreeable sensation. These are the first scientific facts; we apply the knowledge so gained by resolving never to touch fire. This is applied science. We have employed curiosity to find out the facts. We now employ caution to guard ourselves against damage, and we determine never to touch fire. All knowledge is gained by this process; we may be told a thousand times that fire will burn, but we feel that that is only theory; we want facts, and we obtain them by a course of scientific investigation. We use these facts and thus gain experience, knowledge, at first scientific, next practical; and these two conditions make up the sum of all knowledge. Science is the foundation, practice the superstructure.—*Ex.*

SINGULAR ELECTRICAL EFFECT.—What may be called a remarkable effect of electric oscillations has been recently pointed out by Prof. Minchin in *Nature*. Two metal plates attached to platinum wires are sealed in a closed glass vessel containing alcohol. One of these plates has been previously sensitized by some process not described, and it is found that if light falls upon this, its potential differs from that of the second plate by more than half a volt, and may be detected by an electrometer. A slight tap will, however, render the cell insensitive to light; a second tap will restore the sensitive condition, and so on—the two states occurring alternately and being indicated by the movements of the needle to and from the zero position. The influence of an electric spark on such a cell is still more remarkable. If the cell is in the insensitive condition, the sensitive state can be at once restored by simply sensing a spark to pass between the terminals of a Wimshurst machine or of a Hertz oscillator. The effect takes place even if the spark is caused at a distance of many feet from the cell. Prof. Minchin explains the effects by assuming that the molecular state of the surface is altered, and he assumes that light energy can be taken up electrically for one condition but not for the other.

THE WATCH AS A COMPASS.—A few days ago I was standing by an American gentleman, when I expressed a wish to know which point was the north. He at once pulled out his watch, looked at it and pointed to the north. I asked him whether he had a compass attached to his watch. "All watches," he replied, "are compasses." Then he explained to me how this was. Point the hour hand to the sun, and the south is exactly half-way between the hour and figure XII on the watch. For instance, suppose that it is four o'clock, Point the hand indicating four to the sun, and II on the watch is exactly south. Suppose that it is eight o'clock, point the hand indicating eight to the sun, and the figure X on the watch is due south. My American friend was quite surprised that I did not know this. Thinking that very possibly I was ignorant of a thing that every one else knew, and happening to meet Mr. Stanley, I asked that eminent traveler whether he was aware of this simple mode of discovering the points of the compass. He said that he had never heard of it. I presume, therefore, that the world is in the same state of ignorance. Amalfi is proud of having been the home of the inventor of the compass. I do not know what town boasts of my American friend as a citizen.—*London Truth*.

ELECTRICITY IN INSECTS.—M. Nicolas Wagner, by a series of experiments displayed before the Academy of Sciences, showed that electricity produced variation in the color of butterflies. His experiments were performed on *Venessa urtica*. He found that electric currents changed reds into orange and blacks into reds, and with a constant battery, a weak current produced spots varying in shape with the strength of the current. He further demonstrated that the colors naturally existing in the butterfly's wings were due to currents in that organ, the most powerful of which passes from the attachment of the wing outward along the middle nervure to the outer edge. In these experiments he used a galvanometer of 20,000 coils. The following are the conclusions he arrived at: 1. The existence of fixed electric currents in the wings of insects. 2. The possibility by means of electric currents to provoke a change in the shade and disposition of the coloring matter. 3. The possibility, by means of these currents, to produce a kind of atrophy and to change the shape of the wings. He concludes as follows: "With these facts as a basis, I propose to pursue my research on this subject."

A REASON FOR EVERYTHING.—Those who understand the principles of Nature will see them working in all things. We see one plant grow luxuriously and crowd others out of existence or into a spindling life. When a plant does not grow properly, there is a reason for it; and when the effect is seen, the cause should be sought for and removed if possible. The same principle is working all around us in business; and if the heads of weakly concerns lack decision and judgment, the gardener will not be made to dig about the plant and it will die. Sometimes a live head will see the necessity of seeking a new gardener. Men, like machines, outlive their usefulness. The one should be broken up, the other sent to a new field of action. The cause of failure is plain to those who possess occult knowledge. Of course no one would fail if he had the power to see why he fails; the cause is occult (hidden) from him, but not from those who possess knowledge. Education counts for little in such matters.

THE VOICES OF THE DEAD.—A contemporary says the phonograph people have a property which grows more valuable with the lapse of every year. Many cylinders are stowed away with marvelously interesting records upon their waxen surfaces. The Gladstone cylinder is exhibited only on rare occasions and to distinguished guests. It is already an extremely valuable record, and at Gladstone's death it will probably be worth $1000. A cylinder containing a few sentences by old Gen. Von Moltke, now 90 years of age, can also be heard. The signalling of a baby can also be taken by the cylinder, and when its producer has reached man's estate he can listen to his own infantile voice if he has any curiosity that way.

AN enterprising electrician speaks confidently of the practicability of a submarine vessel, which he is prepared to take charge of when constructed. His idea is to make the vessel cylindrical, 12 feet amidships, 60 tons weight, carrying 30 tons of storage batteries, and geared by motors to double-acting propellers on a system which he has already applied.

GREAT ENDURANCE OF THE MAXIM GUN.—In some of the enduring tests of the Maxim gun in Germany, 34,000 rounds were fired from a single barrel, 20,000 rounds of cartridges with steel-covered bullets being fired from a single barrel before the rifling was materially injured.

URANIUM was unknown a century ago, but a lode has been found in a mine in Cornwall, England. It sells for $12,000 a ton.

ENGINEERING NOTES.

Tubular Steamships for Ocean Service.

Mr. John Lockie of Leith, Scotland, holds that shipbuilders have about reached the maximum of speed unless there is a decided change in the structural material as ordinarily used. Steel, he says, will break down of its own weight before the possible five-days' passage from continent to continent is reached.

Another builder with the same end in view suggests possible change in structure as follows:

"In shipbuilding, the use of plates, double T beams, angle irons and trough beams has proceeded with mechanical precision, until we have obtained about the limit of capacity, while we have never thought of, or little regarded, the illustrious examples of locomotion and of floating that nature has kept before us in the tube construction of the bird.

"Permit me to suggest that light steel tubing, such as has become a marketable product at low cost under the recent improvements in gas and electric welding, may become a profitable study to the shipbuilder in the construction of the ship of the future. The principle of spiral welding, by which there is at once the greatest reinforcement of material combined with lightness and tightness, accomplishes in its structural quality all that might be claimed for three times the weight in the ordinary forms of material for like purposes.

"The art of welding and the adoption of the spiral, or twisted form, in which material increases both its tensile and resisting qualities, have instituted an entirely new set of mechanical calculations, and are destined to overcome many structural difficulties that have amounted, heretofore, to practical prohibition.

"The spirally welded tube, then, may be set down as a possible solution of the problems of displacement and resistance, up to the five-day limit of speed for the Atlantic liners.

"The tubes not only convey the idea of lightness and strength, but that of safety, for every tube can be securely sealed as an air-tight compartment in itself, while it is acting with all its force in the construction. It is certainly possible to utilize this principle so that it would be entirely impossible, under any ordinary circumstances, to sink a vessel by collision, and foundering would be unknown. Compartments would be useless, as every part of the vessel except the deck floors, partitions and sheathing would be veritable compartments."

The same writer also suggests the possibility that aluminum may, in the near future, form an important portion of the structural material of large and fast ocean steamers by both increasing their strength and reducing their weight. He says: "This famous metal awaits a readier, simpler and more efficient manumission from its chemical confinement. Aluminum must gravitate into the units per cost pound before we can expect much. I look with great expectancy upon this glorious metal, but I am still convinced that the possibilities of steel are yet very, very great, and that, even with steel, five days from port to port may be comfortably realized."

A NEW ERA IN BOAT-BUILDING.—While the railroads have been pressing forward in the matter of improvements, the steamboat-men have been idle and the Western steamer of today is not as good a vessel as that which existed 50 years ago; but, according to a Pittsburg paper, there is about to be a change in the matter of building steamboats that will make the expense of maintaining river craft much less than it now is. The greatest expense attached to the maintenance of a steamboat is in the hull. A new hull and new machinery will work well together for five or six years, but after that time the hull becomes a constant drain on the earnings of the boat, and in ten years the hull is ready to go to the boneyard. One set of machinery will outlast five or six hulls, and the light framework will last as long as two or three. Messrs. A. J. Sweney & Son of Wheeling have taken the contract for the first steel hull steamer ever built to run in Western waters. The boat will be run in the Chattahoochee river. The hull will be built of angle steel, and will have a wooden "skin." It can be put on the docks and a new hide put on at any time without disturbing the framework, and if deemed advisable, can be covered with steel plates. The boat will be lighter than the common wooden boat, and will cost about half as much more than a wooden boat. Steel angles are continually growing cheaper and timber for such purposes is at the same time getting scarcer and dearer, so that ere long the steel boat will be as cheap as the old wooden affair.

THE FASTEST STEAMER on the Fall River line is the Plymouth, recently built. Her engines have no working beam, but are horizontally inclined with cranks directly connected with the wheel shaft. Her paddles are feathered. She works steam at 160 pounds, with a triple-expansion engine of 5000-horse power. She makes 20 miles an hour. Her speed is all that was anticipated, but is quite short of the famous Isle of Man boats after which she was, in a measure, modeled. These boats make 25 miles an hour, but they are shorter and narrower, while their engines indicate 6000-horse power. They are compound, using steam at 125 pounds pressure. The high-pressure cylinder is placed on top of the low-pressure cylinder, but with a less incline and approaching nearer together toward the single crank to which they are connected. Feathering paddles are also used, as is almost universally the case in England.

GOOD HEALTH.

Dying Usually a Painless Experience.

The signs of impending death, says the *Medical Journal*, are many and variable. No two instances are precisely identical, yet several signs are common to many cases.

Shakespeare, who observed everything else, observed and recorded some of the premonitory signs of death also. In the account of the death of Falstaff, the sharpness of the nose, the coldness of the feet, gradually extending upward, the picking at the bedclothes, are accurately described.

For some time before death, indications of its approach become apparent. Speech grows thick and labored, the hands, if raised, fall instantly, the respiration is difficult, the heart loses its power to propel the blood to the extremities, which consequently become cold, a clammy moisture oozes through the pores of the skin, the voice grows weak and husky or piping, the eyes begin to lose their luster.

In death at old age there is a gradual dulling of all the bodily senses and of many of the mental faculties; memory fails, judgment wavers, imagination goes out like a candle. The muscles and tendons get stiff, the voice breaks, the cords of the tabernacle are loosening. Small noises irritate, sight becomes dim, nutrition goes on feebly, digestion is impaired, the secretions are insufficient, or vitiated, or cease, capillary circulation is clogged. Finally the central organ of the circulation comes to a stop, a full stop, and this stoppage means a dissolution. This is the death of old age which few attain to.

Many people have an idea that death is necessarily painful, even agonizing, but there is no reason whatever to suppose that death is a more painful process than birth. It is because, in a certain proportion of cases, dissolution is accompanied by a visible spasm and distortion of the countenance that the idea exists, but it is as nearly certain as anything can be that these distortions of the facial muscles are not only painless, but take place unconsciously. In many instances, too, a comatose or semi-comatose state supervenes, and it is altogether probable that more or less complete unconsciousness then prevails. We have, too, abundant evidence of people who have been nearly drowned and resuscitated, and they all agree in the statement that after a few moments of painful struggling, fear and anxiety pass away, and a state of tranquillity succeeds. They see the visions of green fields and in some cases hear pleasing music, and so far from being miserable, their sensations are delightful. But where attempts at resuscitation are successful, the resuscitated persons almost invariably protest against being brought back to life, and declare that resuscitation is accompanied by physical pain and acute mental misery.

Death is a fact which every man must personally experience, and consequently is of universal interest, and as facts are facts, the wiser course is to look them squarely in the face, for necessity is coal-black and death keeps no calendar.

PUSH THE SANITARY LITERATURE. — The *Sanitary Record* (London) says: "The future of sanitary progress depends to a great extent upon the good-will and co-operation of the people at large. The vast amount of injury caused by preventable disease is hardly likely to be materially affected until the people work hand-in-hand with the authorities for its removal. Otherwise, medical men may theorize and parliamenta legislate in vain." The opposition to State boards of health, city ordinances, and legal sanitation generally comes from those ignorant of the value of preventive medicine. This has been true of all reforms and advanced thought on any subject. The remedy is education, and how best to disseminate the knowledge accumulated regarding public medicine and the value of hygiene, is a problem that is yet to be given a practical solution. The people have not been taught the value of obeying hygienic laws and the practical worth of general sanitation in every-day life. They have beheld its service in quarantine, in the arrest or prevention of epidemics, but have not been taught the value of sanitation in the conditions that surround them in the ordinary experiences of life.

TREATMENT WHEN FOREIGN BODIES ARE SWALLOWED.—Considering the frequency with which foreign bodies are swallowed, especially by children, the best treatment to employ in such cases should be generally known. A variety of such methods has been advocated, but just now the so-called "potato cure" appears to be the most popular. One physician not long ago reported that he had successfully applied it with the best results in three cases. One was that of a 6-year-old boy, who had swallowed a small weight; another, that of a girl, 9 years old, who had swallowed a nail; and the remaining one, that of a woman who had swallowed a set of teeth. He fed the patients for three days on nothing but potatoes. This treatment is a method in vogue among the pickpockets in London, who, swallowing their booty, live on potatoes until the stolen articles have passed down and out of the body.

USEFUL INFORMATION.

HOW TO WEAR SHOES.—It is true economy, according to *Good Housekeeping*, for every person to have several pairs of shoes, and to wear them alternately. In the first place, by so doing, corns and other soreness of the members may be to a considerable degree avoided. These come from continuous friction or pressure at a certain point, and as no two pairs of shoes "wear" on the feet quite alike, the change breaks up the continuity and obviates or prevents the unpleasant result. It is also better for the shoes themselves. Do not wear them, in ordinary weather, if the best service is desired, more than three or four days, or a week at most, before giving them a chance to become thoroughly dry. Many if not most feet emit sufficient moisture to affect the shoe, giving it the sticky, unpleasant feeling which is so familiar, but to which we do not often give a second thought. Contrast this feeling with that of a shoe which has been standing unused for a week or a month, and notice how grateful the feeling of thorough dryness in the last named. Perhaps the reader never thought of that before.

GLASS AS A SUBSTITUTE FOR LITHOGRAPHIC STONE.—A new use, it is said, has been found for polished plate glass in Germany. Mr. Frederick Winterhoff, of Cologne, recently exhibited in that city a large number of glass impression plates, which will displace the use of stone impressions in lithography. The advantages claimed for plate glass are less bulkiness, as much less room is required to store the prepared plates; the readiness with which transfers can be made from them on to stone, zinc or glass; their freedom from veins and lime flecks, so often occurring in lithographic stones of large size; and the great factor of cost, the cost of glass being a vanishing quantity when compared to the cost of lithographic stone. Transfers from stone require from 30 to 60 minutes; from glass plates transfers have been made in ten minutes, and are said to have been as clear, sharp and fine-lined as is possible in the best lithographic work heretofore accomplished.

FOREIGN COMPETITION ON OUR OWN SOIL.—There seems to be an inclination expressed by British manufacturers to remove their plants, or invest their capital in new ones, in this country, to offset the restrictions placed upon their American commerce by the new tariff law. As it is evident that the passage of this important Act will have a tendency to increase domestic manufactures, it is not remarkable that foreign capitalists are desirous of making heavy investments here. But alien capital and labor ought to be placed under such restrictions that the interests of American citizens engaged in production shall be protected against undue business rivalry on our own soil.

AN ARIZONA NATURAL BRIDGE.—There is said to be in the northern part of Gila county, Arizona, a natural bridge which spans Pine creek by a single arch of 200 feet, with walls on either side rising to a hight of 700 to 800 feet. The bridge is 600 feet wide and the thickness of the arch is 40 feet, rise not stated. The account says that the rock is limestone, worn very smooth by the action of water. One part near the corner of the arch is only 6 feet thick and is pierced by an opening.

A NEW IDEA IN WALL-PAPER.—*Modern Light and Heat* says that an enterprising wall-paper manufacturer, with original ideas, has made use of the beautiful silhouettes of foliage, etc., projected by the electric light, for designs in his business. It would be difficult even for the most artistic imagination to conceive a more exquisite design than we see nightly painted on the walls and greensward of our streets and parks.

PLANT FOOD.—A French agricultural experiment station reports that out of 575 plants the goat eats 449 and refuses 126; the sheep out of 518 plants eats 387 and refuses 141; the cow out of 494 plants eats 276 and refuses 218; the horse out of 474 plants eats 262 and refuses 212; while the pig out of 243 plants eats 72 and refuses 171.

THE POTATO BUG.—An amateur scientist student at Wakefield, Mass., planted a potato in a little soil at the top of a factory, 40 feet from the ground, to see if the potato beetle would find the plant. It has found it, and now the amateur wants to know whether the beetle is a bird or a fly.

HEADS.—The usual size head for an adult Englishman is No. 7. Germans have round heads, Malays small ones. The heads of Portuguese average from 6⅞ to 7 inches; those of Spaniards are a little larger. The heads of Japanese exceed the English average.

GLASS-LINED TUBING, which has the great advantage of preventing lead or metallic poisons of any kind, and of conveying water and other liquids in a state of perfect purity, is coming into use in Great Britain.

HORSEFLESH AS FOOD.—It is said some 14,000 horses are annually consumed as food in the city of Paris. About one-half that number are consumed in Berlin and in Vienna each.

THE BONZANO METALLIC RAILROAD TIE CO. has been chartered in New Jersey, with a capital of $1,000,000, to manufacture steel railroad-ties, under the patents of M. F. Bonzano, assistant general superintendent of the Philadelphia & Reading R. R. Prominent railroad officials and business men are identified with the enterprise.

PAINT-SPOTS may be removed from wood by covering them with a thick coating of lime and soda. Wash off after 24 hours.

THE ordinary sand filter will not destroy or filter out bacteria from water.

ELECTRICITY.

The Electric Motor vs. Steam Engine.

A contemporary claims that the electric motor is probably the most simple and compact piece of machinery ever made for producing power. As much as 25-horse power of apparatus can be set up in a space less than five feet square, and where minimum of space is a desideratum this is an important point. There is only one moving part in the machine—*i. e.*, the armature, and only one set of bearings. The wear is entirely confined to the one set of babbitt shells, the commutator and the brushes, all of which form but a small part of the total cost of the machine, and all of which can be renewed when worn out at a comparatively small cost. When this minimum of moving parts is compared with the number of levers, valves, rods, etc., required by a steam engine, and the necessary accompanying wear and tear, the reason for the low repair account of the electric motor is manifest.

The space taken up by the motor is considerably less than that by the engine. In addition to this the attendance required by an electric motor is very much less than that required by a steam engine, being in general confined to a few minutes' attention each day, while the steam engine requires, while in operation, the constant attention of a skilled engineer. The following comparison of a few points of a steam engine and a Spragne electric motor, each of 10-horse power capacity, is interesting, as showing the greater simplicity and economy of the electric machine:

	Motor.	Steam Engine.
Number of moving parts	1	9
Number of wearing parts	5	20
Floor space (square inches)	8½	36
Room occupied (cubic feet)	16	316
Percentage of mechanical friction	1	80
Actual H. P. percentage of indicated horse-power	100	80
Quarts of oil used per week	¼	12

CULTIVATION OF PLANTS UNDER THE ELECTRIC LIGHT.—The experiments in the cultivation of plants under the electric light, recently made by the botanical department of Cornell University, have given some curious and interesting results, and results which are in some respects confirmatory of somewhat similar experiments not long ago reported from Russia. The first and most noticeable effect of the treatment is an enormously increased rate of growth. The plants which are lighted seem to work day and night and to "run very much to leaf." Vegetables shoot up very quickly, and peas in a few weeks are two or three times as tall as those planted at the same time in daylight. In the case of seeds and fruit of any kind, however, the results are entirely different, and the plants which had grown slowly and by daylight were ahead. It was observed that, in every instance, the reproductive powers of the plant were strongly affected, being sacrificed to mere foliage and rapidity of increase in general size.

SMALL MOTORS MOST SUCCESSFUL.—The economy of small electric motors for industrial purposes is shown in a shoe factory in Brockton, Mass., where for the last year and a half a 25-horse power motor has been running the machinery. This is being replaced with three motors of 15, 10 and 5 horse-power respectively, and a saving of 6-horse power is looked for from the change. The electric-power company that furnishes the current agrees to charge less for the current for the three small motors than it did for the one large one.

AN ELECTRIC MOTOR CAR is being constructed at Springfield which, it is claimed, will be noiseless. It will be about ten feet long and will draw two cars. It will be furnished with 300 cells and two 20-horse power motors, which will give 100-horse power, sufficient for an entire day's work. The mechanism is so arranged that the car can be propelled by either the overhead system or storage batteries. The company making it claims that it will do away entirely with overhead and underground wires.

AN ELECTRIC TRICYCLE has been built at Englewood, Illinois, which it is said can be driven 20 miles an hour on an ordinary road. Its construction is similar to that of the ordinary tricycle, except the size, which is much greater. Beneath the seat is an electric storage battery and dynamo which furnish the motive-power. The battery, it is claimed, can be charged at a cost of 50 cents, and one charge will run the vehicle over 120 miles. The total cost of this novel road machine was $900.

STORAGE BATTERY TRACTION is being rapidly pushed in New Orleans. Thirty cars in all are to be installed within the next few months. Thirty trucks are already mounted with motors and prepared to receive the car bodies

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SAN FRANCISCO:
Saturday, November 8, 1890.

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[NEW THIS ISSUE.]

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See Advertising Columns.

Passing Events.

Among the most notable passing events of the week was the election, general throughout the whole country, and in which both parties, as usual, came out ahead—that is, in different localities.

A fire occurring on Monday morning, nearly consumed the Grand and the Burlington hotels, causing a loss of over half a million. It is generally thought that this fire should not, under the circumstances, have proved so destructive.

A great strike is reported in the Sheridan silver mine, San Miguel county, Colorado. Manager Waters says 3000 miners could not take out the quantity of ore developed in 15 years.

Several of our cheap mineral products, such as plumbago, manganese, etc., are beginning to be shipped East after an interval ranging from 15 to 20 years; 500,100 pounds of pinmbago were sent to London last week, with the prospect that other and probably larger shipments of this mineral will soon follow. Shipments of copper ore and chrome promise also to increase hereafter.

Stanley, the African explorer, arrived at New York on the 5th inst. It is his purpose to lecture on this side, but the chances are that the unseemly squabble in which he has become involved with certain of his aids will materially dim the luster of his exploits on the "Dark Continent."

The city of Chicago has just voted to appropriate ten and a half million dollars in aid of the World's Fair, a sum that, judiciously expended, ought to insure the success of the great show.

The weather in California continues dry and pleasant, though the heavy blow on Wednesday night last is by the weather sharps considered to presage a change, being regarded as the forerunner of rain. Severe storms have greatly interfered with business in regions east of the Rocky mountains; farther west, however, we hear no complaints of this kind.

Surveying the Field.

From all parts of the mid-continent mining regions, as also from those of the extreme West, the intelligence that comes to hand is of a cheerful and in most instances of a highly encouraging kind. Consulting these sources of information, we infer that the output of bullion for the current year will be the largest ever made. That the year's product of lead and copper will exceed all precedent admits of no question, nor is there any doubt but the same would have been true of silver had favorable legislation on that metal been taken a few months earlier.

Of the many localities where notable progress seems to have been made in the mining industry, only a few can here be mentioned or even so much as hinted at.

The discovery of silver deposits, rivaling those of Leadville, are reported in Colorado. The mineral resources of the new State of Wyoming are for the first time beginning to attract considerable attention, while Montana, her neighbor on the north, seems this year likely to surpass all her former efforts, or, as the horsemen say, "break the record." California will be able to make a favorable report, Idaho, Utah and Nevada coming in a good second. In Washington and Oregon the work performed has been largely preparatory, both of these States having a grand future before them. Besides her vein mines, Southern Oregon contains many very valuable hydraulic properties, some of which offer the best possible field for investments, the conditions for the prosecution of this branch of mining being there exceptionally good.

Arizona, recovering from the lethargy incident to the low prices of copper and silver, responds to the improved market for those metals promptly and in a manner alike gratifying to the friends of the new silver law and creditable to the energy of her mining population. The old Tombstone district of glorious memory is taking on new life, the opinion of those best qualified to judge being that history will here, before very long, repeat itself, the thousands now turned out running again up into the millions. We trust this will prove to be the case, because mining, besides being prosecuted with success, has ever been conducted in a clean way down in Tombstone.

In the Silver King mine, also of good fame, a rich strike is reported, this announcement being the more pleasing in that the company, after years of unwonted prosperity, had long been in horrasco—so long that they had begun to despair of the property ever being restored to a dividend-paying basis, a condition now likely soon to be reached. When affairs were at this low ebb and the shareholders were beginning to gather in at the death, the company wisely secured the services of Mr. Oscar Grove as manager in the field. This gentleman, formerly superintendent of the Rainbow, one of California's most successful gold mines, aided by his good judgment and extended experience in vein mining, was not long in discovering the proper direction in which to drive in his explorations after ore, results having confirmed the soundness of his ideas in that connection. That the Silver King of Pinal county, Arizona, will soon come to the front once more may now be expected.

MOUNT WHITNEY, in California, still remains the highest mountain in the United States, Mount St. Elias, once supposed to be 19 000 feet, having by late measurements been determined to have an elevation of no more than 13,500 feet.

Information for the Mining Public.

Not a week passes but we receive numerous letters asking information in regard to the various mining methods, processes and machinery now most employed or of most approved use. As a means of answering these and similar inquiries, we give here a list of the articles published in the Reports of the State Mineralogist on the several topics most apt to be the subjects of these inquiries. While these articles may not in every case contain as full information as might be desired, they are for the most part tolerably complete. They are always authoritative, having been prepared by the State Mineralogist himself or by specialists employed for the purpose.

Commencing with the fourth volume of these reports, there being also several valuable papers in those that precede it, we find this book wholly devoted to a description of the various metals and minerals heretofore found in California with a statement of the place of their occurrence, etc., this, as containing a very full and at the same time the first list of the kind ever compiled, being a work of much interest as well as of great practical value. The next volume in this series of reports is given up to a description of our borax deposits, the methods employed in the manufacture of this salt, a history of the business, etc.

In 1886 two reports were issued by the Mining Bureau, the one covering the first half of the year, having been prepared by Henry G. Hanks, State Mineralogist, and the other, covering the balance of the year, by his successor, Wm. Irelan, Jr. The first of these is largely occupied with an account of the mineral and thermal springs found in California, besides which it contains a variety of other matter pertaining to the subject of mining in general. The other volume of 1886 contains two very important papers, the one on chlorination, prepared by the State Mineralogist, and the other on concentration, prepared by J. M. Adams, E. M., the latter being profusely illustrated. Appended to this book is a complete code of the U. S. mining laws, with much other information of general interest.

The report for 1887 contains, besides two exhaustive articles, the one on the petroleum deposit of California, and the other on the coal mines of the Western coast, several papers on natural gas, asphaltum, building-stone, etc.

Volume 8th of the series, which covers the year 1888, is devoted mainly to a description, by counties, of the gold and silver mines of California, the subject being treated in a most thorough, systematic and intelligent manner and with all desirable fullness, nothing of the kind so complete having ever before been gotten up and given to the public. This book also contains able and invaluable papers on the Milling of Gold Ores in California, Drift Mining, the Smelting of Lead Ores, Metallurgical Processes, Natural Cement, Building Stones, and a variety of other matters of great practical value to the miner, this being one of the most useful volumes in the entire series.

In 1889, the State Controller having withheld the funds appropriated for the use of the Mining Bureau until the working season was half-gone, the report of the State Mineralogist for that year was necessarily much restricted in volume. It contains nevertheless a large amount of useful information, on all subjects vital to the interests of the miner. In this book we have extended papers on the occurrence and working of the auriferous gravels in California; on the refining of the precious metals; river-bed mining; the useful clays; slate quarries; coal products; cement; glass sand; meteorology, etc.

Parties desirous of obtaining information on any of the subjects above mentioned would do well to consult these reports of our State Mineralogist, who will forward either of the two volumes last published, on receipt of postage, being at the rate of 23 cents on the report of 1888, and 14 cents on that of 1889. The other volumes cannot be obtained from the Mining Bureau, but only as they can be picked up outside. We would undertake to procure and forward any volume of the series on application; that is, in so far as they can be had.

A DUTY of 1½ cents per pound is to be levied on the entire weight of ores from Mexico of which lead is the chief component part, instead of on the actual weight of lead in ores, as has been the practice heretofore.

An Irrigation Inquiry.

We have received copies of a circular issued by R. J. Hinton, as special agent of the U. S. Department of Agriculture for the collection of information on irrigation. This branch of Government work, which promises to be of much value and importance, is provided for by the following clauses in the Deficiency law approved by the President Sept. 30, 1890:

Irrigation Investigations—To enable the Secretary of Agriculture to continue to complete his investigations for the purpose of determining the extent and availability for irrigation of the underflow and artesian waters within the region between the 97th degree of longitude and the eastern foothills of the Rocky mountains, and to collect and publish information as to the best methods of cultivating the soil by irrigation, $40,000. *Provided*, That no part of said sum shall be expended under this paragraph unless the entire investigation, collection and publication contemplated herein, including the report thereon, can be fully and finally completed and finished before July 1, 1891, without any additional expense, cost or charge being incurred.

To aid him in securing data for this report, Col. Hinton has prepared blank forms of questions with spaces for answers by those who will contribute the information desired. These questions cover the engineering features of the irrigation enterprises in all neighborhoods, the canals and ditches, reservoirs, dams and weirs, acreage irrigated and character of crops grown; the value of irrigated lands as compared with adjacent arid lands, etc. It is also designed to pay especial attention to irrigation by artesian wells, as well as to all appliances for raising and distributing water.

Col. Hinton has a wide acquaintance with such subjects, as his previous reports to the Government show. We hope our readers will volunteer their aid and apply for blanks for reports, if they do not receive them. All correspondence addressed "Artesian Wells Investigation," Dept. of Agr., Washington, D. C., will reach the spot. It will be a good thing for California to have her irrigation enterprises and their results publicly proclaimed.

A Highly Useful Invention.

Geo. R. Evans has invented a system of tubes for ventilating and disinfecting the holds of vessels, letters patent for which have been applied for through the SCIENTIFIC PRESS Patent Agency, Dewey & Co., Solicitors. By this contrivance, iron tubes, pierced with numerous holes, are extended from the deck of the vessel into the hold, the same being so arranged as to establish and maintain an upward and a downward draught, causing a thorough ventilation of the hold and its contents. This apparatus can also be employed for fumigating vessels, a purpose for which it seems exceedingly well adapted.

The top of the tube, set flush with the deck, is closed, when desirable, with a cap that screws into it, this cap being so beveled as not to interfere with the passage of anything over it. To the top of the tube when open a windsail may be attached, as a means of gathering in an additional supply of air, thus rendering ventilation more effectual. For fumigating the vessel's hold, killing vermin or extinguishing fire, the fluid or compound employed for such purpose is simply poured into the open tube and the cap screwed on, the material being left to do its work. It is expected that the owners of vessels supplied with this apparatus will be able to effect insurance at much reduced rates.

Associated with the inventor of this tube system of ship ventilation is Mr. Philip Giovannini, the mechanical engineer.

As soon as the patent issues for this device a cut illustrating it will appear in the MINING AND SCIENTIFIC PRESS.

Questions Answered.

I. M. Miller desires to be informed through the PRESS how many gallons are contained in an oval-shaped reservoir, 45 feet wide, 48 feet long and 9 feet deep; also, how many gallons of water will pass per hour through a one-quarter and a one-half inch nozzle, 70 feet head, no allowance for friction.

Answer to first inquiry—116,164 gallons. The answer to the second inquiry cannot readily be given, as the rules on which calculations of this kind are based make always a certain allowance for friction, nor is it clear from the writer's wording whether one nozzle or two is meant.

A Scarcity of Miners.

There appears to be at the present time throughout all our mineral regions a scarcity of miners; even in the coal and iron districts of the East, where there is usually a surplus, we hear complaints of this kind. It is not long since work at many places in these districts was restricted to half time as a means of affording those seeking employment a chance to earn something.

In accounting for such changed condition of the labor market, several factors have to be consulted. The extensive strikes, prolonged to weeks and even months in some localities, have caused many miners to abandon that and take to other callings. Among our native-born population, the young men do not generally take to mining; some less laborious employment, with the chances of bigger pay, suiting them better. All classes are being more and more drawn to the cities and the large manufacturing districts, these greatly enlarging the field of labor. Even the sons of miners are less inclined now than formerly to follow the calling of their fathers, this being true even in the mining sections of England, Wales and Scotland, and probably also in those of Continental Europe.

At the same time new mines are everywhere being opened, more especially in the silver-lead and copper-producing regions, the high prices ruling for these metals having greatly stimulated these several branches of mining. The consumption of coal is steadily on the increase, creating a demand for more operatives in this department of the business, the same being measurably true of lead and copper. From California we are, after a long interval, beginning to ship small lots of the useful minerals, such as graphite and manganese, shipments of chrome and copper being meanwhile somewhat increased.

While then the demand for miners is being augmented, the supply is being diminished, giving just grounds to fear that there impends a troublesome stringency in this branch of the labor market, suggesting that effective measures be adopted, if this be possible, to avert the threatened danger.

As far as California is concerned, it would be well were more of our young men and boys to turn their attention to mining. For young men adapted to the business, the chances for making money are better in this direction than in any other. The time spent in learning a trade, if spent in the mines, would often suffice to give them a good start in life, and in many instances might result in laying the foundation for a fortune, the chances of achieving success in the mines, everything considered, being nearly as good now as they ever were. In so far as a certain class of imported labor is concerned, that need not deter our youth from engaging in this pursuit. The Hungarians and Poles, no more than the Chinese, have proved in this country a satisfactory kind of miners.

How Millionaires Are Made.

An Eastern publicist, in an endeavor to enlighten us as to the manner in which most modern millionaires are made, calculates that it has taken the savings of about 1000 wage-earners to create one of these low-grade plutocrats; that is, the small accumulations of a thousand excessively poor people are required to make one excessively rich person. While the above estimate may be correct, or nearly so, as regards Eastern communities, it would not apply on this coast. Here it has not taken the aggregated hoard of more than half the above number to elevate even the most impecunious to the rank of a Croesus, and that for the reason that the earnings of the masses have with us been much larger than in most other countries. The bloating process has, however, been conducted here much the same as elsewhere, the Stock Board having been the most potent factor employed for transferring the little store of the many to the treasure-vaults of the few.

Of the confiding poorer classes, none have escaped—all have been victimized. Everything in sight has been raked in by this essentially thievish method—the small bank deposit and the widow's mite; the laboring man's earnings and the children's dimes; the savings of the sewing woman and the servant girl; the outside lot and the family homestead; all the small sums amassed through overwork and comforts denied, all have gone to over-enrich these plotters against justice and humanity.

But in all this, the methods for robbing the masses to which recourse has been had have not here differed much from those elsewhere employed, the results reached having been much the same. Everywhere it has been the same system of plundering the trusting poor—the many hurtfully impoverished, that the few might be made hurtfully rich. This evil, through the bitter experience of its victims, has come to be much abated. Thankful for this, let us hope that it will soon become wholly a thing of the past.

THE iron molders have notice from headquarters that the strikes at the East are off and the Unions must everywhere act accordingly.

THE employment of nickel for plate armor is likely to much enhance the value of that metal.

Grass Valley and Vicinity.

We present herewith a cut of the town of Grass Valley and its environs. This is in a mining point of view one of the most interesting towns in the State, both because of its historical associations and its present condition. Here it was that quartz-mining in California had its origin, and here to-day we find the most active and prosperous quartz-mining center in the State. Gold Hill, shown in the cut, is the site of the first quartz extracted and milled in this locality. Here as early as the spring of 1851, large quantities of quartz were taken out and piled up awaiting facilities for crushing it. Gradually the business spread to the neighboring hills, shown in the cut, these being low eminences of easy approach, and all the sites of rich quartz veins. Nearly all these veins have in times past been opened, equipped with plant, and extensively worked, the majority of them having paid well, some of them having yielded millions of profit. Not a few of these mines are still being largely and successfully operated, the Idaho having in this respect the best record of any mine in the State.

MAP OF THE GRASS VALLEY MINING DISTRICT, NEVADA COUNTY, CALIFORNIA, SHOWING THE LOCATION OF THE PRINCIPAL MINES.

Grass Valley, the largest and most prosperous town in Nevada county, contains about 4000 inhabitants. It is a well built and beautiful place, being noted for the great number of its fine residences, its orchards, vineyards and flower gardens; and what is still more to its credit, for the high morality and the intelligence of its inhabitants.

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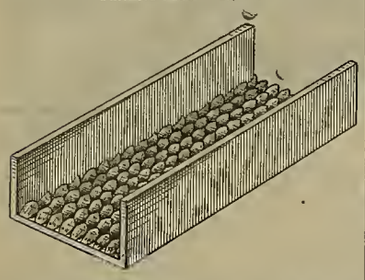

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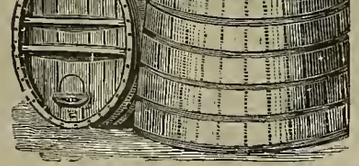

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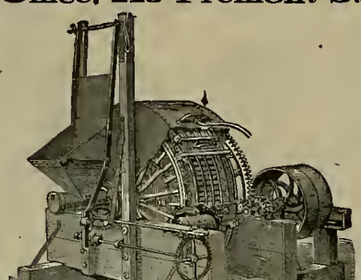

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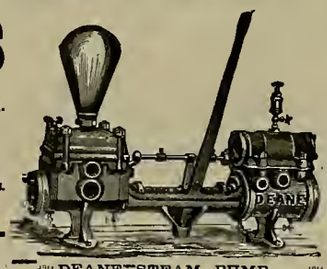

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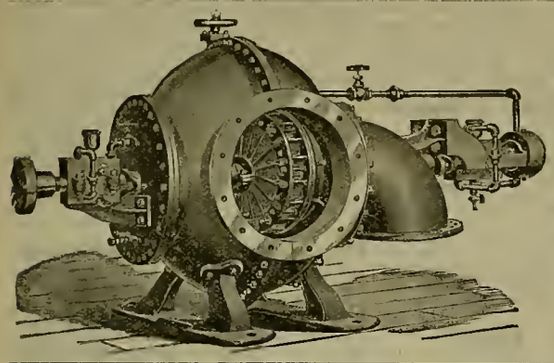

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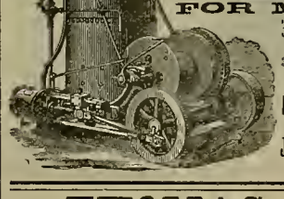

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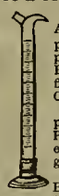

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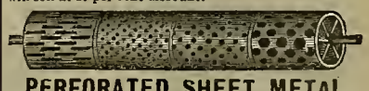

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 6, 1890.

Trade the past week was fairly active considering the exciting election held on last Tuesday. Now that the result is known, trade will resume its normal condition within two or three days. The local money market is fairly easy, with no marked call for speculative purposes or from any particular branch of business.

The steamer City of Peking for China took out the following treasure: To Hong Kong, Mexican dollars, $85,580; gold coin, $29,555; gold dust, $300. To Yokobama, Mexican dollars, $20,000.

MEXICAN DOLLARS—Trade continues dull, with prices ranging from 83½c to 84½c.

SILVER—Press telegrams report the following purchases by the Department at Washington: Nov. 3, the amount offered was 1,060,000 ounces. The amount purchased was 515,000 ounces, as follows: 40,000 ounces at $1.0640, 50,000 ounces at $1.0655, 250,000 ounces at $1.0665, 175,000 ounces at $1.0670. Nov. 5, the amount of silver offered for sale to the Treasury was 1,055,000 ounces. The amount purchased was 370,000 ounces, as follows: 300,000 ounces at $1.0624, 70,000 ounces at $1.0639. As will be seen by the above, the selling offers are still large, which causes many not to look for any reaction for the better in this month. A Washington telegram of Nov. 3 says that the issue of standard silver dollars from the Mints during the week ended Nov. 1 was $848,313. The issue for the corresponding period last year was $815,593. The shipments of fractional silver coin during October amounted to $1,539,589. Bi-metallists are confident that the result of the Congressional elections means free coinage of silver for this country, as that and lower tariff were the chief issues at the East.

BORAX—Receipts the past week aggregate 857 ctls, and exports by sea, 250,316 lbs to New York, 2000 lbs to Central America and 326 lbs to China. The market is strong at full figures.

LIME—Receipts the past week aggregate 4865 bbls, and exports by sea, 700 bbls to Honolulu. The demand is reported to be steady, and confined to immediate requirements owing to the lateness of the season.

QUICKSILVER—Receipts the past week aggregate 382 flasks. The market is barely steady. The demand continues fair for the season.

LEAD—The market is barely steady. Eastern advices indicate a gradual sinking in prices; 749 bars were exported the past week to New York.

IRON—Imports of pig the past week aggregate as follows: Newcastle (England), 170 tons; Oregon, 340. The market is without essential change. Eastern and European advices are conflicting, but the general tenor points to better prices.

TIN—The market for spot is dull for both pig and plate. For plate the tone is strong, but for pig it is unsettled, owing to buyers considering that importers ask too much. At the East and abroad the markets are easy.

COPPER—Exports by sea the past week aggregate as follows: Bars, 13; cement, lbs, 8300; matte, lbs, 536,315; and 34,500 lbs ore. The market is strong at full figures. At the East the market is reported firm under a continued good demand. London cables to the *Iron Age*, Oct. 29, report as follows: Copper has been rather slow and the appearances are that consumers' immediate wants are well supplied by recent heavy deliveries. Holders, however, are not disposed to increase engagements. Outsiders are holding off.

COKE—Imports the past week aggregate as follows: Hull, 150 tons; Newcastle (England), 423. The spot market is strong.

COAL—Imports the past week aggregate as follows: Comox, 4200 tons; Newcastle, N. S. W., 3332; Tacoma, 6850; Coos Bay, 600; overland, 20; Seattle, 7569; Nanaimo, 3736; Vancouver, 1009; Port Townsend, 1100; Departure Bay, 1700; Hull, 1010; total, 31,117 tons. The market in all positions is very strong, with large dealers looking for still higher prices for spot as soon as the weather sets in colder. The yards are bare. Advices from Australia and from the Wellington collieries are of the same tenor reported last week.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, November 6, 1890.

ANTIMONY	— @ 21½
BORAX—Refined, in carload lots	8 @ —
Powdered " " "	8 @ —
Concentrated " "	7½@ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheathing	23 @ 25
Ingot, jobbing	20 @ —
do, wholesale	18 @ 18½
Fine Ingot Sheets	23 @ 25
LEAD—Pig	6 @ 6½
Bar	6½@ 6¾
Sheet	7½@ —
Pipe	7 @ —
Shot, discount 10% on 500 bags Drop, ₰ bag	1 90 @ —
Buck, ₰ bag	2 10 @ —
Chilled, do	2 30 @ —
QUICKSILVER—By the flask	54 00 @ —
Flasks, new	— @ —
Flasks, old	45 @ 55
CHROME IRON ORE, ₰ ton	10 00@ —
STEEL—English, lb	16 @ 20
Canton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Tow Calk	4½@ —
TINPLATE—B. V., steel grade, 14x20, to arrive	— @ —
B. V., steel grade, 14x20, spot	6 12½@ 6 25
Charcoal, 14x20	6 50 @ —
do roofing, 14x20	6 00 @ —
do, do, 20x28	13 00 @ —
Pig tin, spot, ₰ lb, nominal	23½@ 24
IRON—Bar, base	3 @ 3½
Norway, base	4½@ 5½

IRON—Clengarnock ton	Spot.	To Load.
	34 00 @— —	30 @ —
Eglinton, ton	34 00 @— —	30 @ —
American Soft, No. 1, ton	— — @32 00	33 @ —
Oregon Pig, ton	— — @33 00	— @ —
Puget Sound	34 00 @— —	— @ —
Bar Iron (base price) ₰ lb	— @ —	3½@ —
Clay Lane White	26 00@28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Langloan	34 00 @— —	30 @ —
Thorncliffe	34 00 @— —	30 @ —
Cartsherrie	34 00 @— —	30 @ —
Barrow	34 00 @— —	30 @ —
Thomas	33 00 @— —	— @ —
Cargoflest	30 00 @— —	28 @ —

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ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alpha Cons M Co	Nevada	5	25	Sept 16	Oct 22	Nov 11	O E Elliott, 309 Montgomery St
Baker Divide & M Co	California	18	20		Nov 17	Dec 8	D M Kent, 330 Pine St
Challenge Con M Co	Nevada	7	50	Sept 26	Oct 28	Nov 17	O L McCoy, 331 Pine St
Con Imperial M Co	Nevada	29	5	Oct 15	Nov 16	Dec 8	C L McCoy, 331 Pine St
Goleta M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
Gray Eagle M Co	California	20	6	Oct 20	Nov 24	Dec 15	J M Buttington, 303 California St
Gould & Curry S M Co	Nevada	65	30	Sept 16	Oct 21	Nov 13	A K Durrow, 309 Montgomery St
Guasucarau & Cal M & M Co	Honduras	3	10	Oct 28	Nov 28	Dec 16	Edward Oliver, 22 Michigan Ave, S F
Hale & Norcross M Co	Nevada	96	50	Oct 7	Nov 12	Dec 3	A B Thompson, 3 9 M ntgomery St
Mexican C & S M Co	Nev da	41	25	Oct 18	Nov 20	Dec 10	C E Elliott, 309 Montgomery St
Mono G M Co	California	30	25	Sept 18	Oct 18	Dec 2	B L Burling, 3.9 Montgomery St
Montecito M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent, 330 Pine St
Morgan M Co	California	14	10	Oct 30	Dec 6	Dec 29	L C Bresse, 230 Montgomery St
North Peer C & S M Co	Arizona	6	5	Oct 1	Nov 5	Nov 25	Henry Deas, 3.9 Montgomery St
Russell Reduction and M Co	California	7	5		Nov 17	Dec 8	J Morizio, 328 Montgomery St
Sterling M Co	California	1	6	Sept 16	Oct 27	Nov 24	D M K nt, 330 Pine St
Sep Belcher & Mides Cons Co	Nevada	7	25	Oct 7	Nov 10	Dec 1	E H Holmes, 309 Montgomery St
Silver Hill M Co	Nevada	27	20	Oct 8	Nov 13	Dec 3	D C Bates, 309 Montgomery St
Silv r King M Co	Arizona	4	30	Sept 20	Oct 28	Nov 18	Aug. Waterman, 325 Montgomery St
Trinity River T & M Co	California	3	30	Oct 6	Nov 17	Dec 8	Edwin L Griffith, 28 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING	DATE
Confidence S M Co	Nevada	A S Croth	414 California St	Annual	Nov 14
Great Western Quicksilver M Co	Cal.	A Halsey	328 Montgomery St	Annual	Nov 5
Mineral King M & M Co	Nevada	J F Norman	419 California St	Annual	Nov 3
Occidental Con M Co	Nevada	A K Denhron	309 Montgomery St	Annual	Nov 17

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	C Cale	303 Montgomery St	25	Aug 22
Derbec Blue Gravel M Co	California	T Wetzel	622 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 16.		WEEK ENDING Oct. 23.		WEEK ENDING Oct. 30.		WEEK ENDING Nov. 6.	
Alpha	1.55	1.80	1.50	1.75	1.80	2.15	1.75	1.95
Alta	1 55	1.65	1.35	1.45	1.40	1.55	1.40	1.43
Andes	2.30	2.80	2.05	2.35	2.00	2.45	1.70	2.15
Belcher	3.25	3.35	3.05	3.10	2.75	3.10	2.70	2.95
Best & Belcher	3.40	3.85	3.30	3.40	3.35	3.60	3.10	3.30
Bullion	3.40	3.75	3 10	3.55	3.05	3.20	2.95	3.40
Bodie Con	1.70	1.95	1.80	2.00	2.25	2.55	1.95	2.30
Bulwer	.25	.35	.35	.55	.46	.55	.40	.50
Commonwealth	....	....	2.00	....	2.60	....	2 65	....
Con. Va. & Cal	4.75	4.85	4.15	4.70	4.40	4.75	4.20	4.50
Challenge	2.65	2.75	2.60	2.8	2.30	3.00	2.90	3.10
Chollar	3.45	3.75	3 15	3.50	3.15	3.40	3.00	3.25
Confidence	7.50	....	7.00	....	7.00	....	7.00	7.37
Con. Imperial	.35	.45	.35	....	.35	....	.35	....
Caledonia	.55	.60	.45	.50	.45	.50	.45	.50
Crown Point	2.80	3.00	2.75	2 95	2.60	2.90	2.55	2.75
Crocker	.30	....	.25	.30	.35	.40	.30	....
Del Monte	.75	....	....	....	.80	....	.70	....
Eureka Con	4.20	4.25	4.00	....	3.50	4.00	4.00	....
Exchequer	1.40	1.60	1.25	1.40	1.25	1.45	1.15	1.30
Grand Prize	.40	....	.30	....	.35	.40	....	....
Gould & Curry	2.20	2.37	2.06	2.35	2.30	2.45	2.20	2.30
Hale & Norcross	2.10	2.25	2.00	2.15	1.90	2.10	1.80	2.00
Julia	.30	....	.30	....	.30	.35	.35	....
Justice	1.55	....	1 35	1.45	1.50	1.55	1.45	1.60
Kentuck	1.80	2.35	1.95	2.20	1.95	2.20	1.90	2.05
Lady Wash	.60	.65	.45	.50	.40	.50	....	....
Mono	.60	.75	.65	1.55	1.15	1.40	1.00	1.25
Mexican	3.30	3.40	3 00	3.20	3.10	3.15	2.85	3.05
Navajo	.35	....	.35	.40	.40	.45	....	....
North Belle Isle	1.05	1.45	1.35	1.45	1.45	1.60	1.45	1.50
Nev. Queen	.90	....	.75	....	.85	.90	.90	....
Occidental	1.90	2.00	1.70	1.95	1.75	2.05	1.75	1.85
Ophir	5.00	5.37	4.70	6.00	4.65	4.90	4.50	4.65
Overman	2.35	2.45	2.15	2.35	2.25	2.30	2.20	2.25
Potosi	7.25	7.75	6.12	7.25	6.12	6.62	6.25	7.87
Peerless	.25	.30	.25	.30	.35	.40	.35	....
Peer	.25	.30	.25	.30	.25	.30	.25	....
Savage	3.40	3.70	3.00	3.30	....	....	2.85	3.10
S. P. & M	1.45	1.60	1.25	1.50	1.25	1.40	1.25	1.30
Sierra Nevada	3.10	3.45	3.00	3.20	3.05	3.4	2.95	3.15
Silver Hill	.25	.30	.25	....	.20	.25	.20	....
Scorpion	.30	....	.25	....	.25	....	.25	....
Union Con	2.90	3.30	2.90	3.10	2.90	3.15	2.80	2.90
Utah	1.15	1.35	1.15	1.25	1.15	1.30	1.00	1.10
Yellow Jacket	3.35	3.50	3.20	3.35	3 20	3.30	3.00	3.15

* Assessment delinquent.

Sales at San Francisco Stock Exchange.

THURSDAY, Nov. 6, 9:30 A.M.

100	Alpha Con	1.75@1.80	
3.0	Andes	1.65	
100	Best & Belcher	3.30	
600	Bodie	1.75@1.80	
100	Bullion	3.25	
200	Bulwer	.40c	
100	Central	.10c	
100	Chollar	3.60	
200	Con Cal & Virginia	4.45	
300	Con Imperial	.35c	
300	Exchequer	1.25	
60	Gould & Curry	2.30	
150	Kentuck	2.00	
50	Mexican	2.95	
400	N Belle Isle	1.45@1.50	
100	Potosi	7.60	
100	Savage	3.05	
100	Reg. Belcher	1.30	
100	Scorpion	.25c	
500	Syn icate	.10c	
50	Union Con	2.80	
200	Utah	1.05	
300	West Comstock	.50c	

Eastern Metal Markets.

By Telegraph.

NEW YORK, November 6.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	48⅜	1 06	$16 75	$5 76	$21 35
Friday	48⅜	1 05½	16 75	5 65	21 30
Saturday	48⅜	1 05⅜	16 75	5 62½	21 20
Monday	48⅜	1 06	16 75	6 62½	21 25
Tuesday	48⅜	....	....	....	....
Wednesday	48⅜	....	16 76	5 60	21 30

NEW YORK, November 3.—Refined California Borax—Firm, with moderate supply, 9¼@9¾. Quicksilver—Steady, 79@82c. Lake Copper minimg price, 17c; outside lots, 16¾c bid; 16¾c asked; early sale in week, 16¾c; Arizona, nominal, 16@16½c; casting, 14@14½c. Pig Lead, quiet, 6¾c for prompt domestic; $5.26@6.30 foreign to arrive

Coal.

SPOT FROM YARD—PER TON.		TO LOAD—PER TON.	
Wellington, nominal	$12 00	Australian	$ 9 00@— —
Greta	14 00	Liverpool St'm.	8 50@— —
Carbon Hill	9 00	Scotch Splint	8 50@ 9 00
Nanaimo	11 00	Cardiff	8 50@— —
Gilman	11 00	Lehigh Lump	16 50@17 00
Seattle	11 00	Cumberland hk	13 50@— —
Coos Bay	11 00	Egg, hard	15 00@— —
Cannel	16 00		
Egg, hard	16 00	**Coke—English.**	
Cumberland, in sacks	19 50		
do, bulk	18 00	To load	$12 00@13 00
Wallsend	13 00@14 00	Spot, in bulk	16 00@18 00

All spot quotations subject to change without notice.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Removal of the Novelty Plating Works.

The proprietors of the San Francisco Novelty Plating Works have lately removed their establishment from 108 and 112 First street to Nos. 68, 70 and 72, same street. The steady growth and present magnitude of the business done by this company is denoted by the fact that they have since starting, more than 20 years ago, been compelled to make several removals, seeking each time more capacious and commodious quarters, the building they now occupy being one of the largest of its class in the city.

It will be seen by consulting the card of this firm, published in another column, that they make the silvering of copper plates for saving gold a specialty, this being a branch of silver-plating in which they have had large experience. They have filled thousands of orders and can furnish any number of satisfactory references if required.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

Assessment Notices.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 20th day of October, 1890, an assessment (No. 20) of Six Cents (6c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 11, No. 303 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 15th day of December, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office—Room 11, No. 303 California Street, San Francisco, California.

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PATENTS!

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ANNUAL MEETING.—THE REGULAR annual meeting of the stockholders of the Occidental Consolidated Mining Company will be held at the office of the company, room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California, on MONDAY, the 17th day of November, 1890, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, November 14th, at 3 o'clock P. M.

ALFRED K. DURROW, Secretary.

Of Interest to Miners.

Among the many enterprises that have had their origin in our city none have met with greater or more deserved success than has the Fidelity Mutual Aid Association of No 315 California street. Starting only a few years since, it has, by its prompt attention to the claims of its members, created with the insuring public a feeling that a certificate of membership in the "Fidelity" was the best indemnity that could be secured. Granting, as it does, an accidental indemnity equal to that given by any accident company, it also furnishes sick benefits of $8.00 per week, and places this within the reach of all—whether business or working men. Feeling that it is of interest to miners and mining men to know where accident insurance can be secured at the lowest price consistent with safety, we would call their attention to this Association, as it always pays all indemnities promptly and in full, as the following letters from mine superintendents will show:

JACKSON, CAL., Oct. 18th, 1890.

J. L. M. SHETTERLEY, Esq., Sec. and Gen. Manager Fidelity Mutual Aid Association, San Francisco, Cal.—Dear Sir: Your favor of the 8th inst., containing check for $23 in favor of Frank Delporto, duly received. You are making many friends for your Company among the employes of the Kennedy Mine, and it affords me great pleasure to add my testimony to the promptness and apparent cheerfulness with which you respond to the claims for benefits from the men in our employ holding policies in the Fidelity. Yours respectfully,

J. F. PARKS,
Superintendent Kennedy Mins.

IOWA HILL, CAL., July 16, 1890.

FIDELITY MUTUAL AID ASSOCIATION—Your favor of July 14th, containing checks for benefits due J. C. McCarnahan, Jr., and C. C. Campbell received, and I take great pleasure in informing you that the promptness with which you paid the said claims has undoubtedly established the name of your Association among the people as being a safe and reliable Association. I think if you were to have an agent at this place, for here and the surrounding district, that he could succeed in increasing your membership to a great extent, and I would recommend that you appoint W. R. Morton, Secretary of the Washington Mining Co., as such, as I know him to be a reliable and efficient man for the purpose. Hoping that you will meet with increased prosperity, I remain respectfully yours,

S. M. SPRAGUE,
Supt. Washington Company.

AUBURN, CAL., July 28, 1890.

FIDELITY MUTUAL AID ASSOCIATION, 315 California street, San Francisco, J. L. M. Shetterley, Manager—Dear Sir: Your note containing check on American Loan and Trust Co., drawn in favor of James Ward, was received yesterday. The same has been delivered to him and he will receipt to you. Respectfully, etc.,

J. B. PATTERSON,
Superintendent Eclipse Mine.

HATHAWAY MINE, NEWCASTLE, CAL., June 7th, 1890.

J. L. M. SHETTERLEY, Genl Manager Fidelity Mutual Aid Association—Dear Sir: I am in receipt of your check, favor of F. Johnson, for $16 00 for two weeks disability owing to an accident which occurred to him in this mine. This is the third instance in which our boys have to thank themselves for the benefits derived from your Association. With best wishes for the "FIDELITY," I remain, Yours truly,

G. T. TAYLOR, Supt.

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DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, October 28, 1890. At a meeting of the Board of Directors of the abovenamed Company, held this day, a Dividend (No. 37) of One Dollar ($1.00) per share was declared, payable MONDAY, November 10, 1890, at the office of the Company, No. 230 Montgomery Street, Room 11 and 12. Transfer Books close November 5, 1890, at 3 o'clock P. M.

ALTON H. CLOUGH, Secretary.

THE RUSSELL PROCESS.

For information concerning this process for the reduction of ores containing precious metals, and terms of license, apply to

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Park City, Utah.

"A RIGID EARTH," being devoted to Ceology as Applied to Mining. By STEPHEN BARTON. In this work the author addresses him elf to intelligent Miners who have, to some extent at least, familiarized themselves with the accepted theories of elementary geology. He has grouped together numerous observed facts tending to d sprove the igneous theory, and to establish the proposition that below the action and influence of the atmosphere all fissures grow narrower with depth—that metal-bearing veins are produced by causes acting near the surface; and that the realm of successful mining never penetrates the earth one mile. PRICE $2.00. J. O. WARD, General Agent, 64 Main Street, Visalia.

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C. S. HALEY, Secretary

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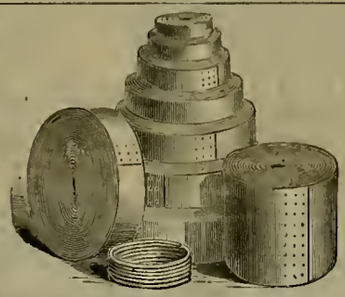

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☞ This Resolvent IS NOT AN EXPERIMENT but a FACT, and it will do the work claimed for it at a LESS EXPENSE than any other boiler purge, AND IN NO MANNER INJURE THE IRON.

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Our water is of the worst character, containing such bad impurities as sulphate of lime, carbonate of lime, mud, and everything that is bad. Very truly yours, WM. R. JONES, Gen. Supt.

No water in the United States produces scale in greater quantity or of a harder nature than the Monongahela River, containing SULPHATE and CARBONATE of lime, iron, MAGNESIA, SILICATE, SULPHUR, ALUMINUM, etc. The following well-known manufacturers, who are large steam users IN PITTSBURGH, and using the water from said river as boiler-feed for all their boilers, USE THIS RESOLVENT in their steam plant, and to whom reference is hereby made: Carnegie Brothers & Co., Proprietors of the Edgar Thomson Steel Works; Dilworth, Porter & Co.'s Spike Works; and Oliver and Robert's Wire Co.; and many other firms in the great manufacturing center WHERE THE RESOLVENT IS MADE. Reference is also given to Robert McMahon, Boiler Inspector for Alleghany Co., Penn., and to the following Railway Companies who use it on their locomotives: Kansas City, Fort Scott & Gulf Railroad; Central Iowa; Mexican Central; Delaware, Lackawanna & Western; Burlington, Cedar Rapids & Northern, Terre Haute & Indianapolis; Mexican National; and Denver & Rio Grande Western.

Upon receipt of order, WITH THE PROMISE OF FAITHFULLY CARRYING OUT THE PRINTED DIRECTIONS, we will furnish, FOR FIRST INTRODUCTION, a Barrel, or Half Barrel, of the Resolvent, and the invoice will bear the following stamp:

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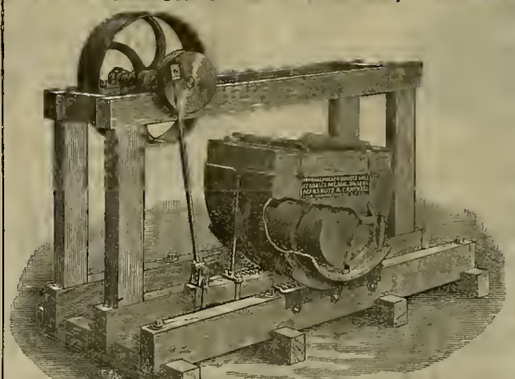

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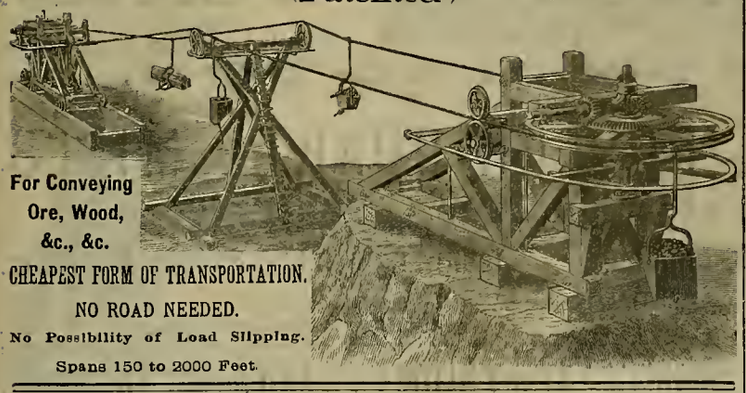

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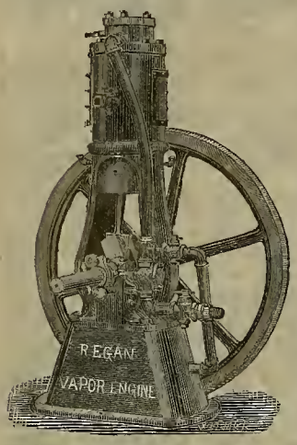

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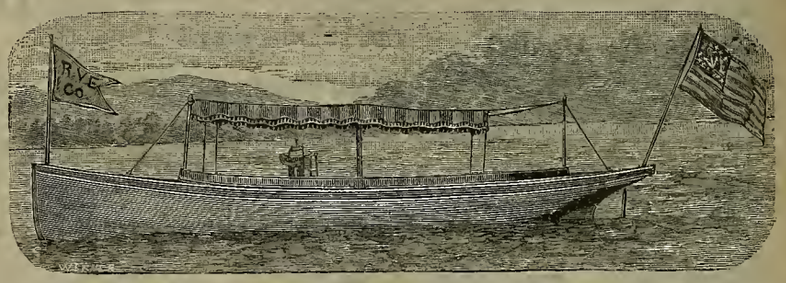
Yours truly, GEO. HAAS.



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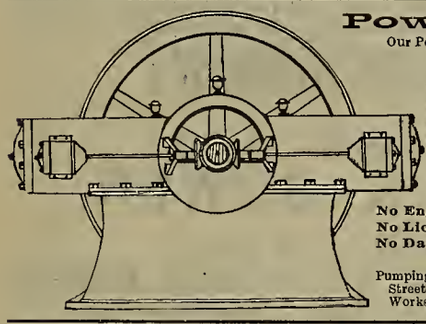

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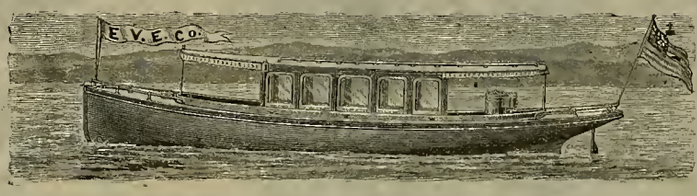

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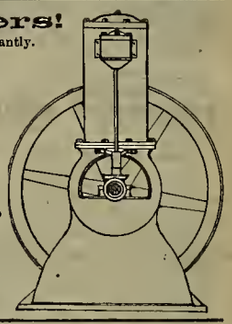

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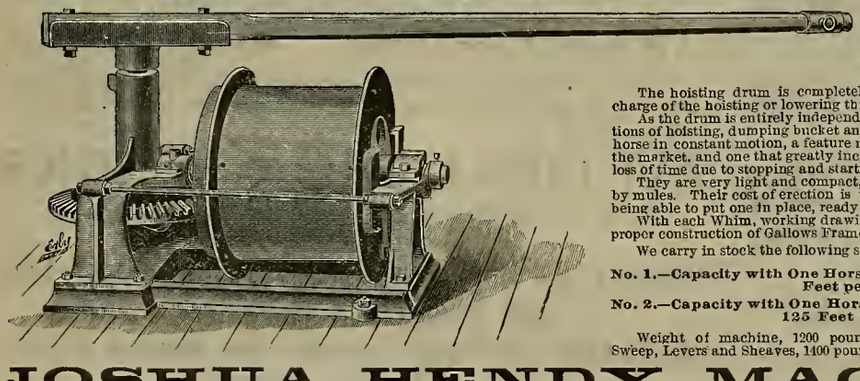

These Hoisting Whims are built entirely of Iron and Steel, mounted on a heavy base plate, and, consequently, are very durable and cannot be affected by extremes of either cold or heat or climatic influences.

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As the drum is entirely independent from the driving gears, the operations of hoisting, dumping bucket and lowering can be performed with the horse in constant motion, a feature not possessed by any other horse hoist in the market, and one that greatly increases their capacity by avoiding the loss of time due to stopping and starting the horse.

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With each Whim, working drawings are furnished, showing in detail the proper construction of Gallows Frame and foundation for Hoisting Whim.

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No. 1.—Capacity with One Horse and Single Line, 800 pounds, 75 Feet per Minute.

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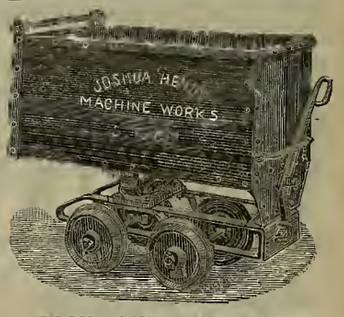

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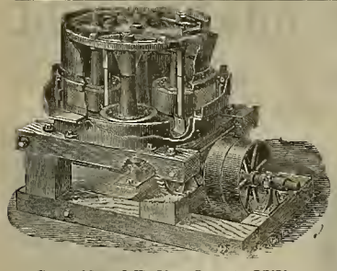

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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

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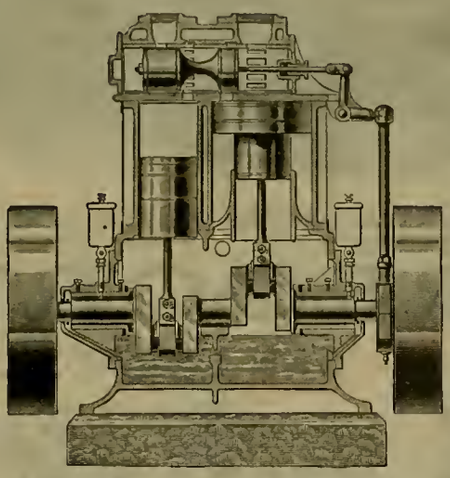

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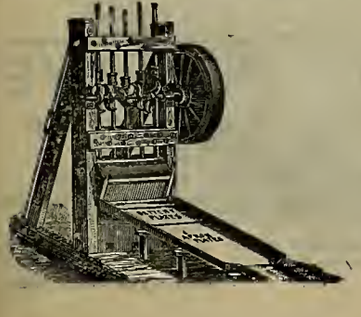

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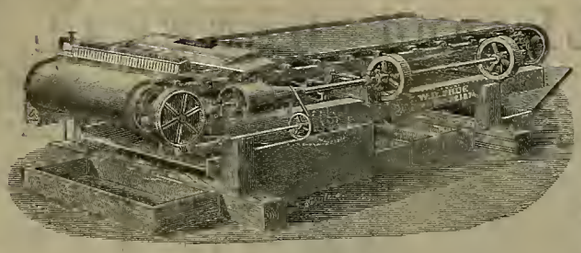

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N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

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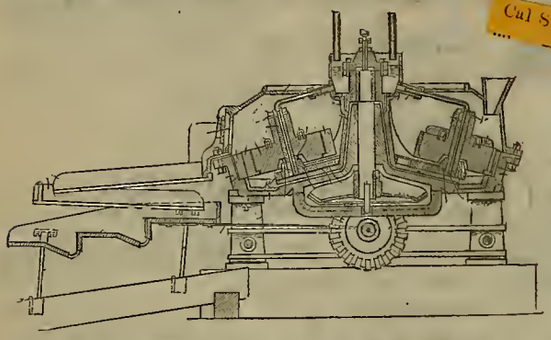

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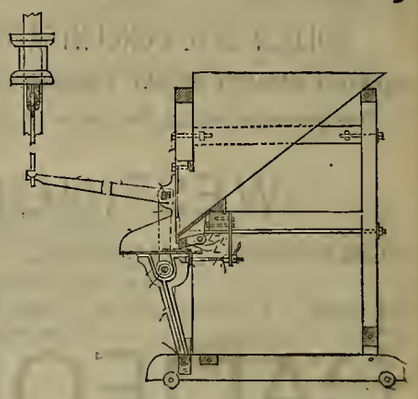

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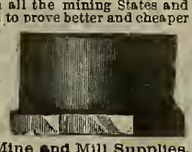

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.— Number 20.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, NOVEMBER 15, 1890.

Three Dollars per Annum.
Single Copies, 10 Cts.

Does It Pay in the End?

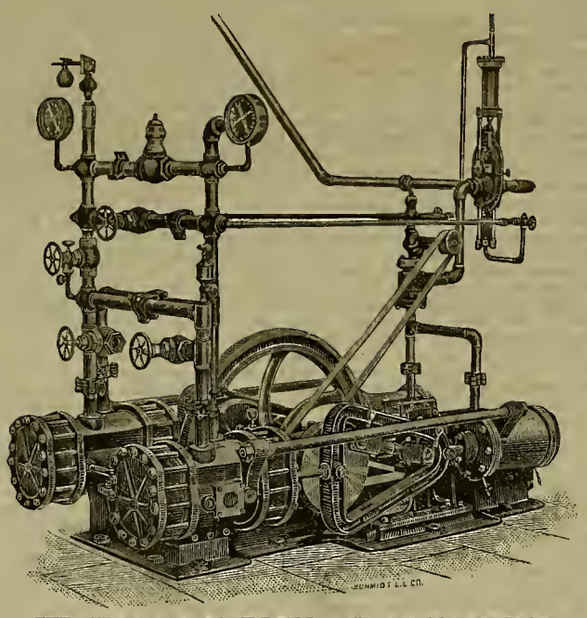
It has ever been a question with casuists whether or not wealth wrongly acquired is worth what it costs. Some people think it is. Very many in fact hold that opinion and, acting accordingly, hurry off and without much regard to the means employed, "make haste to be rich." And yet there lives not a sentient being but recognizes in his inner consciousness that this doctrine is dangerously and atrociously wrong.

We took occasion not long since to comment in a mild way on some of the methods made use of by the non-producing guilds to rake in the little money dabs of the laboring classes. Alluding to that modest effort, an interior journal observes that, while these methods are objectionable in a moral point of view, they are after all simply business, not running counter to the usages that largely obtain in most commercial and trade circles. Perhaps so. Certain it is, they do not much run counter to the usages that obtain with the bunco steerer and the burglar, which crafts regard also their vocations as simple business.

It is not a hopeful sign when the public conscience can tolerate or the public journalist write with complacence about things like these. Excuse them as we may, we have an idea that the man who makes his money through recourse to these sharp and cruel practices is weaving into the web of his existence colors that will not "run;" they will prove fast enough—so fast that they cannot be washed out with any detergent soap. It may even be doubted if blood would wholly erase them. We hold that it is a perilous thing to do a wrong that cannot be repaired. This, if any, must be the unpardonable sin. And how shall the man who robs indiscriminately, who reaches out and gathers in the pittance of the poor, ever be able to make restitution, however much he may desire to do so? This can never be done. The wretch may endow colleges and churches, set aside millions for the payment of post mortem prayers and masses; yet what can these avail, the victims of his inhumanity remaining impoverished and ruined? He may reach out and seek to rescue them, but he will find when it is too late that they have drifted away beyond his reach, and unless there shall be found in the resources of Divine wisdom some way in which these men can, in the hereafter, be enabled to make amends for the wrongs they have done, the hard old doctrine of eternal damnation will be likely to prove true enough.

The daily press having recently informed the public that a couple of convicts had made their escape from San Quentin, goes on to say there are now two violators of the law at large. It would be pleasant to believe there are only two!

Let it not be said we are sermonizing overmuch. We are simply dealing with well-known facts—performing a duty which, as the organ of the mining community, and in some sense of the working classes generally, we could not consistently ignore.



THE CUMMINGS ROCK-DRILL AND AIR-COMPRESSOR.

Prescott, Arizona.

We present on this page a cut of Prescott, the leading town in Northwestern Arizona, and county seat of Yavapai county, the largest political division of that Territory. Prescott was formerly the capital of Arizona, since removed to Tucson, Pima county. Though deprived of this advantage, Prescott remains the most populous town in the Territory and a place of much business importance, being the center of an extensive mining and agricultural region. There is also located here the military post known as the Whipple Barracks, the garrison at which serves to enhance the business and enliven the town.

Prescott enjoys the further advantage of being the southern terminus of the Prescott & Arizona railroad, a branch of the Atlantic & Pacific road, which it joins 74 miles to the north. As will be seen by the cut, the town is regularly laid out, the streets being straight and crossing each other at right angles. There are a number of handsome buildings in the place, some of which are not without architectural pretensions. The courthouse with its tall tower, seen near the center of the picture, is a fine edifice, having been built at a cost of $75,000. Prescott is increasing rapidly in both business and population, its future prospects being equal if not superior to those of any other town in Arizona.

For Compressing the Air and Piercing the Rocks.

A new invention, known as the Cummings rock-drill and air-compressor, is in the field, challenging the attention of mining men and contractors as well as inventors. For this device the proprietors claim a number of advantages owing to cost, weight, simplicity, durability and effectiveness. It is a compact, comparatively light machine, and runs with great smoothness, performing its work otherwise in a way that looks as if it might be able to make good some of its claims at least to superiority. We welcome in the field this new contestant for favor, not that we are without excellent machines of this kind already, but because its introduction is in the line of healthful competition and legitimate progress.

The Cummings machine can be seen at 59-61 First St., San Francisco, where the proprietors hold themselves in readiness to explain its construction and exhibit its working powers.

CHAS. G. YALE, our long-time associate, is returning Westward, and will soon resume his editorial chair.

Baer, Photo,

VIEW OF PRESCOTT, ARIZONA.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Prescott, Arizona.

EDITORS PRESS:—Prescott, the former capital of Arizona, is located a little northwest of the geographical center of the Territory. It is the county seat of Yavapai county, the largest subdivision of the entire Territory, embracing an area of nearly 30,000 square miles. This immense county—larger than many States in our Union—will doubtless be divided, and already the question of division is beginning to be agitated. But Prescott will always remain the principal city in Northern Arizona. It is already largely in advance of any other town in population, and it is the center of movements in business which will tend to further increase its relative importance.

Prescott is beautifully located. It is circled about by hills, but the site upon which the city is built is sufficiently level. The courthouse square, with its trees and greensward, stands in the center of the city, and ranged about this are the business streets. The courthouse cost $75,000, and it is a fine structure. It is surmounted by a tall tower, in which the city clock strikes off the hours as they come and go. Several of the merchants of Prescott have their business housed in good brick structures, and plans are perfected for at least a half-dozen similar buildings to be erected within a year. A good brick hotel was receiving its finishing touches during the visit of our correspondent. There are some beautiful and tasty homes in the more desirable quarter of the city, that of Ex-Governor Tritle being among them. The climate of Prescott can hardly be surpassed by that of any city on the Pacific Coast. There are 300 sunshiny days every year, as shown by signal-service reports, and the quality of the atmosphere is unequaled. The elevation of the city above the level of the sea is about 5000 feet, so that the air is pure and dry. Very little snow falls during the winter, and the ammeres are not excessively warm. Showers come during the summer, which keep vegetation green and lend a freshness to the landscape. The health and enjoyment of the people seem to be far above the average of people in most parts of our country.

Whipple Barracks, a military post of the United States, are but a mile from Prescott. The location is extremely pleasant, and the presence of the troops contributes not a little to the social and business importance of Prescott.

Prescott is reached by rail via the Atlantic & Pacific R. R. and the Prescott & Arizona Central, being at the terminus of the latter road, 74 miles south of its junction with the former at Prescott Junction. The Prescott & Arizona Central passes through immense stretches of stock and agricultural lands, and one cannot fail to have some appreciation of the future possibilities of Arizona as he rides across the fresh plains of this portion of the territory. Vast herds of stock are pastured here, while occasionally one sees cultivated areas which produce as fine fruits as can be raised even in California. Prescott is the focus of extensive mining interests. There are few institutions in the city itself which would suggest this fact, but nevertheless it is true. No great mills, with their thundering stamps, are to be found here. There is only one institution within the limits of the city which reduces ore, and that is a sampling plant. But within a radius of 60 miles there are innumerable properties, in different stages of development, some of which are now only prospects, while others are great ore-producers and dividend-paying mines, with mills or smelters turning out bullion. In this article we cannot enumerate more than a tithe of the better properties. We will first catalogue the leading mines or groups of mines, and then give detailed information as to a few of these. We may name first the United Verde mines (silver-copper) at Jerome, 28 miles north of east from Prescott; the Congress mine (gold), 55 miles southwest of the city; the Senator mine, 12 miles east; the Boggs and Hackberry mines (smelting ore), 25 miles southeast; the Ryland, 45 miles south; the Crowned King (gold and silver), 30 miles south; the Bell mine (silver smelting ore), in the Big Bug district, 17 miles southeast; the Prince mine and Tuscumbia mill (30 men employed), at Alexandra, 30 miles south; the Copper Basin, 10 miles southwest; the Rapid Transit, War Eagle, Silver King, and other properties in the Hassayampa and Bradshaw districts; also the extensive hydraulic properties on Lynx creek, 7 to 12 miles east; the Hillside mine, 18 miles west (now shipping gold and silver ore), also the Eureka copper mine, owned by same company and in same locality. Then there are the Baumann group of mines, 15 miles east, in the Black Hills (of which a description will be found in another part of our paper), and a great variety of properties in a similar state of semi-development. The location of the above and other properties will be made more clear to the reader by an examination of the accompanying map, prepared expressly for this number of our paper. As may be inferred, the map does not indicate one-tenth of the properties, but it will give the reader a general idea of the geography and extent of this region.

Besides the exclusively mineral properties, attention might be directed to an extensive onyx quarry, which has recently been opened and which has been noticed to a considerable extent by local papers and even by outside journals. This property is situated 25 miles southeast of Prescott, and covers an area of 200 to 300 acres. There are 11 claims. The onyx is taken out in slabs of almost any desired dimensions, the strata being unusually thick and well defined. Prof. Falkenau of San Francisco, who recently visited the mine, witnessed the blasting of a slab from the quarry, and he states that in all of his experience he has never seen a mine which equals this in respect to the enormous size of the blocks obtainable.

Although the rock taken from the mines in question is not, strictly speaking, a pure onyx, it yet has most of the qualities of that substance, being susceptible of a high and brilliant polish, which emphasizes the varied and beautiful colorings that may thereby be developed. It will prove a highly prized substance for the manufacture of table and bureau tops, mantels, etc., and when readily secured by the opening of the properties, and when its beauties become more generally known, it will meet with a ready sale and prove a profitable mine to its several owners.

While at Prescott, our correspondent could not resist the temptation to visit the great silver-copper mine at Jerome, known as the United Verde. The camp is but 30 miles from Prescott, but on account of the heavy grades in the road leading to the mine, a good part of one day is occupied by the stages in reaching this destination. For 20 miles the way is comparatively smooth, the road being through the low hills which inclose Prescott on the south and soon reaches Lonesome valley, an almost level stretch of country extending to the foot of the Black Hills. At Sanders Station, 20 miles from Prescott, the traveler will stop for a good, hearty dinner. From here forward the heavy work of travel begins. The next ten miles are a succession of steep grades, and for almost the entire distance the roadway is cut out of the sides of mountains, with frowning canyons extending hundreds of feet below. This road was an expensive one to build, and except for the great value of the property beyond, no company would have ventured upon the work of its construction. Arrived at the mining camp, we see the buildings of the company almost *hanging* upon a mountain-side. A site had to be graded for every structure. The few buildings in the town of Jerome, a half mile farther on, are similarly situated. The present plant of the company consists of a smelter containing two furnaces, rock-breakers, etc.; and there are also hoisting works, carpenter and blacksmith shops, mat-house, boarding-house, and several less important buildings. A reverberatory furnace is now being built, and enlarged machinery has arrived for the hoisting works, the former hoist being entirely inadequate to do the work required of it. There are roasting-beds on the side of the mountain, part of the ore being taken out of a tunnel on a level with these beds, and after being roasted returned to the shaft and there hoisted to an upper level where the smelters are situated. The mining operations throughout are not extensive, but are conducted under difficulties on the plane laid out by the former company. Most great mines become such by a system of evolution. The United Verde is no exception and is in its early stages. Despite the great disadvantages under which the discoverers of this ledge labored in opening their property, they persisted, full in the faith that they had a mine which would warrant the expenditure. They obtained their machinery and began operations. Their faith was at once verified. The mine made excellent returns. Eventually the present owner, W. A. Clark, Esq., of Butte, Montana, was induced to purchase the property, and now the work of evolution is progressing rapidly, because there is no lack of capital to prosecute all needed improvements. Besides the new machinery above alluded to (now about to be put in) there are to be built a system of tramways from the mine to Verde Station, where the ore and mat are at present shipped to favorable points for final working. The distance will be 15 miles or more. Through the mountain region it is proposed to have the tramway run upon a certain level to some feasible spot, and there a perpendicular hoist will be arranged to elevate the cars to a higher level. By a similar system, the cars will be lowered on the other side of the summit to the level of the valley in which Verde Station is located. These tramways will be the precursors of a steam railway, which will doubtless be built to the mine in the near future. At present the richer ores and the mat are freighted over the mountains at great expense by mule teams. The United Verde and adjacent mines in the same belt will fully warrant unusual expense in providing transportation facilities by steam, and by the time these are obtained we shall see at Jerome a more extensive, if not a more promising, camp than is now dreamed of. Other locations are soon to be developed, and the prospects are that the United Verde will be but one of a group of mines in the locality already made famous by this great property. The United Verde Company now gives employment directly and indirectly (as miners, teamsters, wood-choppers, etc.) to 300 or 400 men. The building of a railroad to the property will deprive a large portion of these teamsters of occupation, but by the time such an improvement is inaug-

(*Continued on page 321.*)

The Gold Belt of California.

NUMBER I.

The Ancient Placere and Their Relation to Wall Rocks.

[Written for the MINING AND SCIENTIFIC PRESS by STEPHEN BARTON, Kernville, Cal.]

There is a growing disposition to study the wall rocks of a metal-bearing lode and from that standpoint to endeavor to deduce some rule as to the mode of occurrence of valuable ore bodies throughout the lode. This study has been made to yield results with almost mathematical exactness in the Bonanza mine at Sonora, Tuolumne county, also at the Willard mine, near the town of Murphys, in Calaveras county. Some observations have tended to show a loss of silex in the walls of the lode in proportion as it appears in the lode itself. The porphyries of the mother lode are being studied, and in obedience to rules observed elsewhere, a higher percentage of gold is being searched for in the west wall of the Comstock.

Since the source from which the ancient placers were fed remains a mystery, the question arises as to whether light may be shed on the subject by the study of wall rocks. I know that all this is foreign to the idea that ore bodies are results of accidental eruptive force; but it only serves to remind me of a conversation I recently had with three mining experts who were discussing the richness of the "blue gravel" deposits, which, at certain points, have discharged their wealth into the South Yuba. After the immense treasure still stored there had been fully discussed, I asked the question which is made the subject of these articles, "Where did that gold come from?" One of the party, while looking to the others for acquiescence, said in substance: "Most of that gold came from lodes between soft and friable walls, and has been bottomed and removed by the eroding forces which plowed out the ancient channels. In some places the bottoms of the lodes are still left on the tops of the ridges, and in other cases lodes of great force are seen to-day, penetrating the earth to great depth." I reminded him that this idea was hardly in accord with accepted theories in the matter of a whole system of metal-bearing lodes having been bottomed by denuding forces. He responded that mining experts paid very little attention to accepted theories. Said he: "Your lodes here at Kernville are mostly in the granite, and that is the reason why so many of them pinch out at the bottom or in the gulches." If this reasoning is correct in regard to Kernville, then deeper mines should be found in the metamorphic rocks east of present exploration.

There are places where the metamorphic rocks extend to great depths below the beds of the ancient rivers, and there, at least, we should be entitled to search for a reserve from which the ancient channels were fed. As we turn to the history and circumstances of placer mining, we shall seem to see evidence that millions were supplied by a local source, and from the geology and configuration of the country that millions upon millions remain.

If any one not conversant with the facts was told that a little bit contained within two parallel lines running north and south, not more than one mile apart, had yielded nine-tenths of all the placer gold in California, which was contained in lumps worth more than $1000 each, astonishment would be the result. The surprise would not be lessened if told that the quartz mine of California which had yielded the largest lump of free gold in a quartz matrix was within the same belt. Still surprise would only be increased if told that it was a physical impossibility for any of these lumps to have been carried from any known quartz lode by natural causes. Now, after all that has been written about the mother lode, if we should turn to the scientist and say this was five miles east and up the mountain from the mother lode, we shall only be capping the climax. I believe all these propositions are within the facts, but before I specialize localities I must generalize a little further.

Original research is all that will enable us to master the unsolved mysteries of mining. Whoever will look at the attitude of the scientists 25 years ago in relation to the geology of mining, and will compare it with the position of the most advanced of standard authorities of to-day, will see that we have drifted, are drifting, and are almost without sail, rudder or anchor, so far as relates to the occurrence of the gold bearing matrix. When we find it we know where it is. Solomon, heathen as he was, knew that much. True, it has been said that some of the best gold mines in South America are between granite and diabase. But this only looks to the immediate contact. We must remember that the gold-bearing lode occurs in every kind of contact met with in metamorphic formations. If it has not been mined in recent years, I can go and show where a thin sheet of quartz rich in free gold appears in a solid ledge of blue limestone. This is the most impossible place for gold to be found in a gold region. I made this fact public and furnished specimens before the MINING AND SCIENTIFIC PRESS was founded. There was no capping, and the two rocks were as nearly "froze" as quartz and lime could be. My knowledge of that class of lime rock of which I have broken and handled thousands of tons teaches me that that vein was probably four or five feet deep and eight or ten feet long, and that the whole vein probably contained $20—possibly $100. Some scientists may question this statement. If any public-spirited man acting in a public capacity will call on me and ask me to do so, I will accompany him to that place at my own expense, and show him the spot, and probably obtain him a specimen showing free gold. This, too, is within that one-mile belt. Now what I want and what the miner wants, and what we must have, is a science which can explain the presence of gold wherever found—a science which does not have to be rewritten every third year. Before digressing in a subsequent chapter, I will say that the specimens referred to were furnished to H. C. Bennett, editor and publisher of the Columbia *Times*, and appropriately noticed by him.

There are several things relating to the history of placer gravels which may be learned by studying them. Where the gravel is well rounded and pretty uniform in size, the inference would be it had been driven a long way. When the gold was very much water-worn, the conclusion would be that it had entered the stream near its source. Where the pebbles retain more or less of their original angularity and vary very much in size, the inference will be that they were not driven far. Where the gold is rough and craggly, and in grains of every size from the finest flour gold to lumps of 50 or 100 pounds, the conclusion will be irresistible that they had not been transported very far nor long subjected to the assorting power of water. Water has a transporting power in proportion to surface exposed, and flour gold is nearly all surface.

These conditions have all been noted and commented on by miners engaged among the ancient placers. It is not hard to point out where $150,000,000 were mined within a few miles of a given point, and if the character of the deposit can be made to refer the origin of this wealth to a locality where the character of the formation bespeaks for it the proper place for deep and strong gold-bearing ledges, the rising generation may conceive it worth their while to turn their attention in that direction. Most of the placer-miners had very little knowledge of quartz, and had a vague and ill-defined idea that most of the placer gold came from volcanic eruption. They made no search for the gold-bearing lode, and since it would differ radically from a gravel deposit it might have been mined over, in many cases, unnoticed. The accessible placers were mined out. The miners had no families. Many were drawn away to the silver mines of Nevada. They neither perpetuated their own race nor imparted their knowledge to others, and to-day California can boast of but few able-bodied young men competent to manage a ground-sluice. The placers are neglected, and because these men, who knew nothing of quartz, mined over this ground, took out wealth and departed like the Toltecs, in search of the terrestrial paradise, the capitalists give this region the go-by. Canals which cost hundreds of thousands of dollars still pour their sparkling currents among gravel piles where the young pine has taken root and offers a lonely home to the cooing dove.

Over such a region as this there once swept a current strong enough to carry along a nugget of gold containing $8000, and remember that gold is more than once and a half as heavy as lead, and that the accompanying gravel was very little water-worn — two circumstances which can only be reconciled with the hypothesis that this lump had rolled but a short distance.

(*To be Continued*)

Letter from Arizona.

EDITORS PRESS:—I write you from a district that, having already attracted much attention by reason of its high-grade ores and peculiar character of its mineral deposits, seems to have a great future before it, as the following facts would tend to denote. The ore from the Vekol mine, which has been shipping since 1881, has shown an average value of $500 per ton, that being the valuation on which the S. P. R. R. Company based their freight charges. Eight carloads of this ore sent to Kansas City in 1882 yielded a total of $40,000. There are in the Vekol mine 2½ miles of tunnels, besides a great amount of shafting, drifts, etc. Miners acquainted with both localities claim this camp to be the Leadville of Arizona.

I have studied the district for nine years and know every foot of it. The ore is found in limestone, there being no signs of its presence on the surface except stains of iron. It occurs in a succession of chambers covered by a talo ceiling and dolomite flooring. One chamber alone, knocked down by two miners, yielded $35,000. The ore was originally discovered in the roof of the mountain ranging over a great basin. It pitches south and west, one chamber occurring after another in endless succession. As at Aspen, Colorado, you sink in the lime for it. The whole covering on the west and south side of the mountain is the same, and as a prominent mining authority remarks, if it exists in one place it will probably be found in many others, spreading out over many acres. We have splendid water facilities here and plenty of fuel. Southern Pacific R. R. 30 miles distant at Maricopa or Casa Grande.

ARTHUR H. ELLIOTT.

Le Roy, Pinal Co., Arizona, Oct. 27, 1890.

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San Bernardino County.

Its Mineral and Other Reeourcee.

NUMBER XIX.

[Written for the PRESS by JAMES H. CROSSMAN.]

Alvord Mining District.

Alvord Camp is sitnated in Alvord moantain, in tha central portion of Alvord district, at an alevation of 2500 feet above the level of the sea; distanoe from Daggett, 20 milss; from Camp Cady on the Mojave river, nine miles. Thls isolated moaatain range is usiaiportsat fn dimensions, hut to the practiced aye of prospector and miner it forms an attractive featare and one that warrants a careful examinatioa. Oa approaching the monntain from the Mojava river, on its soutberly flank a daap oanyoa is asen exposing its struotnral formation to a depth of aaveral huadred feet. Its make-ap is oomplex aad oomposed of many varieties of stratified rock—porphyry, syenite, micaceous schist, feldspathic rock aad calcareous shales—from tha yallow magaesian stone to a coarse-grained carbonaosous marble, conrsiag northeasterly and sonthwesterly, and dipping easterly at an angle of 45 degrees. From the mouth of this canyon, lu u northwesterly direction, and at a distance of 3000 feat, we reach the

Alvord Mine.

The vein here cuts the formation at u right angle. The gangue is a jaspery quartz carrying free gold, mnch of it visible to the naked eye. Select pieoss are often sufficiently rich to be used for lapidary parposes. The footwall of the veln is composed of a secondary ayenltio rock seamed and banded with olvine, its hanging-wall being a ooarse-grained carbonaceous lime throngh which courses st varying angles wfth the trend of the vein, feeders and stringere of oalcspar often found rich fn gold, for a distance of from 30 to 40 feet from the main lode. The ores extracted from the mine have been selected and hanled by freight teams to the oompany's mill at Camp Cady, nine miles distant. The yield is reported hy the owner of the mine (Mr. J. B. Osborne) to have varied from $40 to $140 per ton. Large quantities of the lower-grade ores remain in place and on the dump, their values varying from $5 to $8 per ton. The vein, which varies in width from 3 to 18 feet, is traceable hy developments and o.oppings for a distance of 2000 feet—its greatest expansion being near the canyon. The main ohnte or ore body has a longitadinal extent of 115 feet and an average width of 12 feet.

Thia mine has been opened by an adit driven from a point 40 feet above the bed of the canyon in a westerly direction on and fn the vein for 350 feet, connecting with Shaft No. 1, 103 feet from the anrface; thence for a distance of 78 feet, connecting with Shaft No. 2, which is 110 feet deep; thence easterly 40 feat, a shaft has been sunk 35 feet deep in an ore of low grade.

At Camp Cady, nine miles distant, a mill has been erected contsinlng five stamps and two of the largest size Hnntington pans, which are kept steadily at work.

No water appears here on the snrface except after heavy rains, bnt the poroos sands of the lake-bed, like a sponge, contain a large percentage of water, as has been demonstrated hy a number of wells sunk here from 5 to 12 feet in depth.

Joe Dandy hill, which forms a central point of thls mineral district, is situated 30 miles north of Ludlow Station on the A. & P. R. R., and 10 miles northwest of Soda Lake Station on the old overland stage-road, at an elevation of 3200 feet above the level of the sea.

Near the westerly border of the district, a low mountain range occurs, conrsing northerly and sontherly. It is 20 miles long by 4 in width. In fts southerly extension at Cave Springs, the Mojave river having eroded a passage, finally sinks in Soda lake.

Two hundred and fifty miners' inches of water oan be obtained at Paradise valley, three and one-half miles distant, at a sufficient elevation to oonvey it to the mouth of the oasyon.

Solo Mining District.

Whfch appears to oontain all the elements of snooess, oomprises within its bonndary linee a enperficial area of 432 sqnare miles, of which the bed of Soda lake occupies a space of 36 sqnare miles—this oonstituting an inexhaustible sonroe of water supply. From this point the make-up of the range is largely of an eruptive character, in combination with sqneous rocks. Porphyry in immense dykes cuts the formation, as well as the several varieties of limestone. Magnesian, carbonaceons and blue limestone is everywhere seen. Profnsely capping the metalliferons veins or coursing with them as incasing walls, lithological growth and decay is everywhere present, the geological structure being sufficiently varied to embody a history of its own. At points where the mines are located, disintegration has performed an important part in exposlag the ore bodies along the lode. From the summit of the hill, extending downward in an easterly and sontheasterly direction, the mineral ontcrop covers a enperficial area of 500,000 square feet. Where denudation of the lime cap or blossom has not taken place, exposing the ore body, the cap of lime presents a smooth, unbroken surface everywhere stained and discolored hy the hydrated oxide of iron and the metallic oxides, demonstrating the presence of the metalliferons product at greater depth—the cap lavariably yielding low assays, hut wherever penetrated, high-grade ore is found. Tha ores are argentiferoas galena with their sacoadary products—carbonates and sulphates of lead aud chlorides and salphfdes of silver. The gangne is silicious, calcareoas, aad both overlaid and nnderlaid hy porphyry and limestons. At the point of tha greatest expaasloa, a blue limestons forms the anderlie. Tha names of the principal mines or locations are as follows: The Gambetta, Lydia Hatzel, Grant (Gift), New Year's, New York, 1XL, Homestake and Frijole—there being in all 14 locatidas.

The Gambetta.

Which lies on the eastern slope of Joe Dandy hill, forms the sontherly exteasioa of the New Year's, lyiag parallel with tha Grant (Gift) aad Lydia Hetzel, which lie oa the western flanks of the hill—the intervealng spsca being mineralized, showing spots, bnaches and stains of ore in the croppings. A notable featnre, and one that is indicative of extensive ore bodies in depth, is that from the surface down to a depth of froia 4 to 40 feet, the cap rock only yields hy assay from 5 to 10 ounces silver per ton and from 5 to 6 per cent lead, while below that point the value of the ore rapidly appreciates, retnrning assays varying from 60 ounces silver to $5 to $15 gold valnes and from 30 to 40 per cent lead. In the Lydia Hetzel and Graot (Gift) the vein matter shows on the snrface a widtu of 120 feet; also in the Gambetta and New York. From the highest point on the hill where the fedge fs exposed to the lowest point of exposure, the vertical difference is 500 feet. A large number of assays taken from various points in the mines yielded from 50 to 275 ounces silver per ton, with a *ley* of gold and from 30 to 50 per cent lead. Hand-picked specimens run as high as $13,000 per ton. It is safe to say that the entire ore body will yield 50 oances of silver and 40 per cent lead. Crossing the sontherly apex of the hill is a porphyritic dyke, which, with its oompanion strata of lime, is 1000x3000 feet—this formation being also mineral stafned, showing the thorough mineralization of thls section.

Developmente.

A tunnel from the north side of the hill has been extended sontherly for a distance of 500 feet and will requlre to be carried 100 feet farther to reaoh a point nnder the main ore channel. The Camphell tnnnel, which has been driven 75 feet sontheasterly through the ooantry rock, intersects the Lydia Hetzel lode at a vertical depth of 70 feet, crossing the vein for a distance of 17 feet. The first 7 feet fs free-milling ore carrying 50 oz. silver, $15 in gold valnes and 10 per cent lead in the foim of a carbonate. The next 10 feet carries 40 per cent carbonate of lead with small values in the precious metsl. This is known as the first west lode, and is separated from the east parallel lode by ten feet of porphyry (evidently a horse). The osprock is invarlably hard, but when cut through the formation it is found to be soft and much decomposed.

Developments on the Gambetta consist of a 12-foot shaft; 50 feet farther west a 12-foot crosscut has been driven in the veln. In both of these free-milling ore oocnrs.

From the Gamhetta, 1½ miles in an easterly direction, another and distinct group of miues occurs, on which oonsiderable work has been done, the mineral contents being of the same general charaoter as those of the Gsmhetta, with the exception that the ore here carries argentiferous copper in the form of glance. Select samples of thls ore have assayed up in the thousands. Wood and water occur in abundance at a point seven miles distant from these mines—the road thence being down-grade to the site seleoted for reduction works. Strange as it may seem, this promising mineral sectfon is hnt little known ontside of the distrlot in which it occnrs. The owners are men of limited means, bot being firm believers in the fnture of their property, will hold it for the advent of the "iron horse," which sooner or later will traverse these desert regions.

Five Point District

Adjoins Solo district on the north and is situated in the same mountafn range. In thls district ten other locatioas have been made—the formation, charaoter of veins and ore being similar to that of the mines already de scrlbed.

(To be Continued.)

MINING IN CHINA.—The Mo-ho gold mines in China now employ over 10,000 men, mostly natives of Shangtung. There are four mines. The Goveroment takes four-tenths of the gold extracted, the remaining six-tenths going to the miner. Sometimes a man will get none out of a whole day's work; at other times several ounces will he obtained. The regnlations are very strict, and any theft is severely pnnished. The machinery employed is not got from abroad, hnt made in a factory near the mines. It is thonght that with European machinery the output wonld he much larger.

COOLIES FOR WORK IN MEXICO.—The new line of steamships hetween Mexico and China has begun operations. The first three steamers will bring ont 2000 coolies for work on the Tehnantepeo railway. It is probable that many of these laborers will remain in Mexico, which is in great need, especially on the coast, of a snpply of cheap labor. The Monterey & Gulf railway will soon be in full operation between Venadito and Victoria, the capital of the State of Tamaulipas.

The Utilization of Niagara Falls.

A contract was awarded on Saturday last to Rogers & Clemens of this city to construct a tanal parallel to Niagara river for the Cataract Construction Co. The consideration involved is not announced. A bond fn the sum of $300,000 has been executed by the firm. Work will be commenced immediately aad must be finished in January, 1892.

In 1886 the Niagara River Hydraulic Power Server Co. was incorporated by a special Act of the State Legislatnre. At various times the charter was amended, and the name finally changed to that of "The Niagara Falls Power Co." In July, 1889, this company awarded the Cataract Construction Co. the contract to construct at Niagara Falls works which will develop 119,000-horse power. Since that time the contractor has been preparing plans and specifications for the work; the sub-contract just awarded is the first decided move which proves to the public that the preliminaries are nearly finished, and that it is certain the works are to be built. At the present time the contractor has a commission in Europe studying plans of plants of similar nature with a view of ascertaining the most practical method of constructing the Niagara plant.

Up to date, plans for any portion of the plant, excepting the tunnel, have not been adopted; consequently the manner of connecting the tunnel with the upper river is not known. There will, however, be a canal either with or without a series of traverse surface conduits, which will conduct the water to penstocks and thence upon turbine wheels. The tunnel, which is to be merely a tail-race, will receive the water from the turbines conducting it below the Falls. The details upon which this tunnel fs to be constructed are at hand. It is to start at a point below the Falls under the suspension bridge, extending through the rock to the upper river to a point 6700 feet from its month, where a head of 120 feet will be obtained. It will be 28½ feet high, 18 feet wide, with a semi-circular top of 9 feet radius, and straight sides. The fall will be 36 feet to the mile.

The company owns 225 acres of land along the river suitable for millsites, 75 acres under water adjacent to said land, and 1100 acres lying back from the river about midway between La Salle and Niagara Falls. It has been estimated that the flow of water over the Falls amounts to 12,785,455 cubic feet a minute. To develop 119,000 horse power with a 120-foot fall would require hut one-fifth of 1 per cent of this volume. From these figures it will be seen that the power is almost inexhaustible. If this plant soon to be constructed proves to be a success—and there is no reason to believe that it will not—the power now running to waste, reaching a figure almost beyond the comprehension of the mind, can be utilized by additional plants of similar nature.—*N. Y. Engineering and Mining Journal.*

THE HUDSON RIVER TUNNEL is being pushed as rapidly as possible from the New Jersey side; about 150 men are now employed and the progress is more rapid than formerly, being about four feet a day. Some 350 feet of iron tunnel is now finished, in addition to the reconstructed portions of the old enterprise. Work on the New York side has practically ceased for the winter. The old tunnel has been strengthened and a bulkhead built at its end. The present intention is to build the shield for this heading on the shore and sink it into position in front of the bulkhead in the spring. Unless satisfactory arrangements can be made with the French steamship line, which runs the docks above the tunnel, this plan will not be possible, as the shield will have to be sunk directly in front of the entrance to their wharves, and the vessels will thus be prevented from using the docks for some time.

IMMIGRATION continues to increase, and is very large, a sure indication of probable "good times" for some months at least. For September it is 18 per cent larger than last year; for the seven months ending with September, 12 per cent larger. The increase is largely from Italy and Poland, hnt less decidedly so than it was some months ago. British emigration now constitutes about one-fourth instead of one-third of the whole. The Canadian emigration is not recorded, owing to lack of provision for accurate records, but is really something like one-sixth of the total immigration, there having been in 1880 nearly as many Canadians as English and Scotch living in this country.

NEW YORK STREET CLEANING for the quarter ending Sept 30th, cost $264,411.86, or $105,359.12 less than for the first quarter of 1890, and $83,111.95 less than for the second quarter. The area swept aggregated 314,179,328 sqnare yards, and 355,461 cartloads of ashes and garbage were removed. Of this, 19,850 loads were used for filling city lots and the remainder carried to the sea. The city received $13,886.60 for the privilege of trimming the scows. Fines amounting to $3938 were collected.

THE phosphate mines of South Carolina afford more revenue to the State than ordinary gold mines. The royalty of $1 a ton on the rock removed from navigable streams for the year just ended amounts to $237,150, or $25,000 more than last year's income, and the highest on record.

Successful Trial of an Admirable Steam Road Wagon.

An inveation which is bound to prove of much importance to Western lumbermen, farmers and mine-owners, has been tested at the Atlas Iron works at the Potrero. The invention, patented by Californians, consists of a steam road wagon, which promises to revolutionize freight-carrying in districts remote from the railroads. This machine is the patent of Captain Roberts of the Sacramento Transportation Company, and differs materially in construction from any road wagon or traction engine heretofore invented. The usefulness of the old-style steam wagons is almost destroyed for mountain travel, or for work where numerous turns are necessary, owing to the fact that the steering apparatus is too complicated and the power is indirectly applied which prevents the maintaining of any considerable speed without the use of an immoderate amount of fuel. There has for years been a demand among farmers for a road wagon that would do away with the necessity of using horses, which in many localities require one-third of the profits of a ranch to maintain. This trial of the new invention demonstrated the fact that the machine will in the near future be in general use as a freight hunler. It was constructed at the Atlas Iron works for Messrs. Bradford & Way, of Sonora, Tuolumne county, for hauling lumber over the mountains, and is the second of the kind manufactured by that company. The wagon is constructed entirely of wrought iron and steel, there being no cast iron except in the cylinders. It has three traction wheels made of cruiser steel, to which power is applied directly, exactly as on a locomotive. The steering wheel supports one-half of the weight of the machine, and works on an axle horizontal to the axle of the rear wheels, so that the same pistons drive all three wheels. The steering wheel is, however, so constructed with a ball-and-socket joint that the application of power is continued even while the machine is turning at a sharp angle. The truck in front is connected by a hydraulic steering apparatus, which swivels on the ball and joint. The machine weighs about 16 tons and can develop a 225 horse-power and a speed on level ground with a light load, of from eight to ten miles an hour. The intended speed for all occasions, however, is about four miles an hour.

The trial was under the supervision of Capt. Roberts, the inventor, General Manager Jardine of the Atlas Works, Supervisor Noble and S. S. Bradford of Bradford & Way, and the test was a severe one. The trial course was over a distance of about 2000 feet, up a grade of about 10 feet rise to the 100 linear feet. To the machine was attached five wagons weighing two tons each and loaded with 40 tons of pig iron. The machine was started with a steam pressure of 155 pounds, and pulled the enormous load over the course without a stop, having on 185 pounds of steam at the end of the course.

The machine will be shipped to Sonora and will haul 20,000 feet of wet lumber at a load. The wagon bids fair to come into general use on the plains and in the mountains where the engines heretofore have proved too complicated in construction and too cumbersome for general use, while the power applied through gearing was not sufficient for ordinary purposes, and the speed was unsatisfactory.

UNION PACIFIC EXTENSIONS.—As regards the probable extension of the Union Pacific into California, the present situation appears to be like this: The company have made surveys into both the northern and the southern parts of the State, but as to actual extensions nothing has yet been certainly decided upon. The surveys into Northern California were completed some two years ago. The surveys into the southern part of the State were made recently. Three surveys were run, all from Ploche, Nev., southward. One runs to Homer, and another to Ludlow, points on the Atlantic & Pacific road. The third survey runs to a point on the Southern Pacific railroad. All of these surveys were made to furnish to the directors of the company information about the State. At the present time the company is building about 555 miles of new road. The extension from Milford, Utah, to Pioche, Nev., a distance of 145 miles, will be completed by Feb. 1, 1891. Another of our important new roads is the one from Portland to Seattle.

SCARCITY OF NICKEL.—The nickel appropriation of $1,000,000, as ordered by the late Congress for armor-plate, has resulted in the discovery that there are only about a dozen nickel mines in the world, and only three are on this continent. The output of these mines is doubtful, and one source may not be sufficient. Other nations may also see the advantages of the new alloy, and it is said that Krupp's representatives already seeking to gain possession of the Canadian mine. The other two American mines are in Nevada and in Lancaster county, Pennsylvania.

A SCHEME FOR PROTECTING RAILWAYS FROM FLYING SAND is suggested by Prof. Schubler, a German botanist. He proposes to use the roots of the plant *triticum repens L.* The roots are cut in a machine into lengths of 20 centimeters, mixed with a little earth, clay and water sufficient to form a dough-like mass. This is spread with a spade over the sand, and in a couple of weeks it begins to spread and bind the sand.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—*Ledger*, Nov. 5: Laying of the 15-inch flanged steel pipe at the Wildman mine is now finished. The work was done by experts at the business. The joints between the flanges are all lead-corked the entire 2000 feet, and five or six ¾-inch bolts to hold the joints in place. It has been pronounced by the best of judges to be the best job of the kind ever done in the county. The hoisting works will be detached from the old pipe in a few days and it will run the mill exclusively, which will give the mill and machinery a more even motion, and is bound to give better results. The mill will be started about Nov. 10th, instead of December as mentioned in last week's letter. Cros cutting both east and west still goes on in the North Star. The ground is still hard and breaks slowly, and there is nothing encouraging in sight as yet. As the lay of the ground renders it very uncertain as to where the ledge should be, they feel that a favorable change might set in at any time. At the Rose mine they still continue to drift south. They are nearing where something good is looked for, but will continue, however, for some time yet. Enlarging and putting the Lincoln ditch in good order for the winter run is finished and the mill will be started up again in a few days and will likely be kept running steadily through the winter.

PLYMOUTH. — *Dispatch*, Nov. 4: The Pacific mine is working but a few hands at present, and no one seems to know whether it will improve in this respect in the future or shut down altogether. The New London is pursuing the even tenor of its way with a full force of men, and all its stamps going, so we may reasonably conclude it is paying well.

Mariposa.

WHITLOCK MINES.—*Gazette*, Nov. 1: The two-stamp mill of Helm Bros. is running in full blast. Its capacity is about three tons in 24 hours. That little mill has pounded out in Whitlocks over $100,000. Ellingham & Grove are running their mill on a 100-ton lot of ore that is paying remarkably well. Ward & Brother have started up the Whitlock mine with excellent prospects. The Reed, the Hayseed and the Ward Bros.' mines are all making profitable runs. Mr. King has bought out Mr. Curtis' interest in the claim that yielded the 24-ounce chunk. Mr. King is ruoning a hand mortar on his pocket mine.

Nevada.

PENNSYLVANIA MINE.—*Tidings*, Nov. 6: Work on the new hoist at this mine is being pushed rapidly, the building being 80 feet long and well constructed. It has been covered with a redwood shingle roof and this has been painted and presents a fine appearance. The work of retimbering the shaft has been done in a first-class style. The machinery is in good condition and there are about 150 cords of wood on hand. Space has been left on the north side of the hoisting works for a ten-stamp mill which will be procured in San Francisco.

STRUCK PAY GRAVEL.—The Centennial Mining Co., prospecting on the Washington Ridge, has finally struck pay gravel at a distance of 800 feet from the mouth of the tunnel. The gravel was struck by making ao upraise of 14 feet from the tunnel. The company has been very energetic in carrying on the work notwithstanding many drawbacks.

COE MINE.—The appearance of this mine since it has been pumped out is satisfactory to the company that has taken a bond on it, and they are willing to go on with further expenditures in developing the property with the intention of finally taking it under the terms of the agreement with the owners.

VARIOUS MINES.—*Transcript*, Nov. 7: There is renewed activity in mining in this district. The Nevada county mill is kept busy crushing custom rock. The new hoisting works of the Federal Loan mine are nearly completed. The prospects at the Manhattan are exceedingly good. About 20 men are employed at the Nevada City mine and the prospects of its coming to the front again are very encouraging. The Mountaineer and Champion are looking spleodid, and the latter is paying dividends with great regularity. Negotiations are pending for the sale of the North Banner quartz mine of this district. The ledge at the Gold Bank tunnel is improviog with every stroke of work dooe upon it, and the discovery of a large body of ore is looked for soon. Supt. Lord is making good headway at the Original Spaoish mine on Deer Creek below town. Pumps are to be put in and the shaft which is now down 150 feet is to be sunk another 100 feet. Tributers who have been taking out the ore will have a cleanup this week. The strike at the Harmony drift mine oear this city will have a powerful influence in advaocing the value of otber claims in tbat locality and in stimulating their development. The Cold Spring location on one end and the Milliken claim on the other will doubtless soon be heard from in a substantial way.

ANOTHER RICH FIND.—Henry Kohler and Thos. Van Oudshoorn of Washington, while doing assessment work on one of their claims six miles above that town on Canyon creek, have struck a large ledge tbat is said to be the richest ever found in that section. They estimate it will pay $100 to the ton.

WASHINGTON RIDGE.—*Herald*, Nov. 4: The wealth that exists on what is known as the Washington ridge, extending from Sugar Loaf mountain to Omega is untold, but we believe there is enough to load three or four ships. At the extreme ends the ground has been proven to he fabulously rich. The lead was worked partly out in the Manzanita, Live Oak and Nebraska claims, and between $3,000,000 and $4,000,000 taken out within 3000 feet, and on the outskirts of the main lead between $1,000,000 and $2,000,000 were extracted, and all previous to the year 1860. Since then little has beeo done except in the Manzanita claim, which was for a time worked by hydraulic process. The early working was all done by drifting. The impression in the early days was the same that it is now, viz.: that the chaonel extends up the Washington ridge. The Harmony Co. struck the channel 20 odd years ago, a mile and a quarter above the Nebraska ground, and took out $60,000, but having started in on the wrong side of the ridge, and not having depth enough to their drift, could not work the ground profitably. Recent developments there show that the channel is the same as below, and indications all plainly point to its extending up the ridge. There is a vast field for prospecting companies for a distance of six or eight miles, and there is but little doubt that the now idle ground will be explored in the near future. There is no better place for prospecting operations in California.

NORTH BANNER MINE.—*Tidings*, Nov. 10: This property continues to yield remuneratively, and from the outlook will develop into "a big thing." It is understood that the company could have paid a dividend some time ago had the directors desired, but the surplus has been devoted to substantial improvements aod to the purchase of a full stock of supplies for the winter and early spring. That regular dividends are in store for the stockholders is almost assured.

THE W. Y. O. D. MINE is fast coming to the front as one of the paying mines of the district. A crushing of 84 tons of quartz, occupying 20 days, yielded about $40 per ton. To-day was pay-day, and everybody seemed happy. There are about 25 men employed about the mine. A new seven-inch pump is being placed in the bottom. The drifts are being steadily pushed ahead and there is a good ledge on each side of the shaft.

HARMONY GRAVEL MINE.—Grass Valley *Union*, Nov. 11: The strike in the Harmony gravel mine near Nevada City has sent up the stock from 20 cents (which went begging at that price) to $10 per share. Prospects of 75 cents to the pan have been taken out in the last few days. This strike is the most important, in gravel, that has taken place in the vicinity of Nevada City since the early days of mining, and gives great encouragement as to the future. The channel is known to be extensive, being considered as the same that traverses the county from You Bet to the north side of the Yuba. This strike will be the means of starting other prospecting operations on the chanoel on each side of the Harmony location.

ANOTHER DRIFT MINE.—*Transcript*, Nov. 10: The Fountain Head Gravel Mining Co. is being reorganized at this city to work the drift claim on the Washington Ridge adjoining the Cold Spring. A. Isoard, E. Muller, I. J. Rolfe and B. C. Waite are the principal stockholders. The recent rich strike in the Harmony claim on the same lead and near by, has revived confidence in the Fountain.

A GOOD PROSPECT.—A crushing of quartz from a location on Cemeot Hill, northwest from Nevada City, belonging to George Fletcher and John Skewes, gave over $15 in free gold to the ton. The sulphurets assay over $1600 to the ton.

Placer.

MINING NOTES.—*Republican*, Nov. 1: Since hydraulic mining has been suspended much interest has been taken in other kinds of mining the past two years with good success. We expect to see the mining interest once more flourish and be again recognized as the foundatioo of every industry of the State, and those now that are its most bitter enemies will be its warmest advocates. The Tai Sing Co. of Indiana Hill declared a dividend last week of $26,000 on their entire stock for the past year. The company will soon erect a 20-stamp mill near their works to overcome the heavy expenses of running their cement the great distance they are now doing.

Shasta.

CENTERVILLE.—*Democrat*, Nov. 5: Peter Cowen and Sheriff Hopping's mine is located about one mile below the postoffice on Tadpole gulch. Mr. Cowen has erected a good cabin on the ground and is making other arrangemeots by which to further develop this ledge. This property has been prospected hut little, but sufficient to induce him to spend time and money in further developments. The ledges are in a contact formation, being porphyry footwall and slate hanging-wall.

LOWER SPRINGS.—Walton, with a small crew, is working on the property of L. Y. Smith on the north side of Middle creek. Copeland thinks he has the biggest mine in Shasta county.

MOUNTAIN VIEW.—This mine is on the southeast slope of the mountain, lying between Iron mountain and Harrison's ranch on Whisky creek. Their house and shaft are located on the west side of their tunnel. A persoo can almost locate the tunnel by looking from Shasta and other points from this place. The ore assays up in the thousands. Take it on an average will go $15 to $20. They have abundance of wood, also 30 or 40 inches of water the year round.

Sierra.

ABOUT SIERRA BUTTES.—*Tribune*, Nov. 8: The mill at the Mountaio quartz mine is ready to run, and as sooo as the tramway is in working order the stamps will begin crushing the precious ore for all it is worth. The Mountaineer M. Co., T. Berger, Supt., has purchased ten stamps complete out of Yuba mill, from the Sierra Buttes Co. The ore of this company averages well. They are building a mill, boarding-house, blacksmith shop, stable, and have just finished a cottage for the superintendent and family. Employment in this mine is giveo to 30 men. Three additiooal stamps have been put in the Wm. Tell mill, aggregating eight, and rock averages good monthly cleanups. Times are slowly but surely improving at Sierra City and adjacent mining camps, well merited by the energetic and public-spirited citizens of this rich mineral region.

Trinity.

VARIOUS LOCALITIES.—*Journal*, Nov. 8: William Berry came up from Oakland last Friday to put up the mill on the Chloride mine, Canyon creek, for the Fisher Gulch Mining Co. Mr. Taylor has done considerable prospecting for quartz in the neighborhood of the South Fork of the Trinity, and has found one lode of which mention was made io the *Journal* some months ago. There has been considerable mining along this stream, but it never was a paying stream, although a few good spots were found from time to time.

Tuolumne.

BADGER MINE.—Union *Democrat*, Nov. 8: It is reported on good authority that the developments on this mine are showing fine. The mine, which is situated about five oriles below the Raw Hide, to the west of the Mother Lode, has lately passed into the hands of San Francisco parties who are energetically developing it.

SOULSBY MINE.—Work on this mine will soon be resumed by English parties. The Soulsby has been extensively developed and yielded in the past hundreds of thousands of dollars. The news of resumption of work on this mine will be hailed with pleasure by the entire county. It means another industry and a successful one in the opinion of those who know its history and record.

RISING SUN MINE.—A rock-breaker has been recently sent to this mine and the mill will soon start on good ore. It is contemplated to add five more stamps to the mill.

THE COLBY.—*Independent*, Nov. 8: On Thursday, 3000 feet of pipe for the old Colby mine reached town. The pipe will be used for the conveyance of water from the ditch for the working of the mine, to replace the present steam-power. This is no doubt the most promising pocket mine in the county, and under the efficient management of Superintendent Kelley, golden results may be expected.

NEVADA.

Washoe District.

CON. CAL. & VA.—*Territorial Enterprise*, Nov. 9: 1200 level: Continue the extraction of some milling ore along the line of the north drift. 1300 level: Ore of a fair quality is still being extracted from the junction with the upraise. 1500 level: Extracting some ore io drifting northeasterly from the junction with the upraise 260 feet north from the Con. Va. shaft. 1600 level: Have contioued to extract ore along and above the line of the drift run east through the old stopes on the sill floor of this level. We are also working southerly from this drift, stoping out ore. 1650 level: From the various openings we have taken out ore of the usual quality and quantity. From the north lateral drift from the Con. Va. shaft an upraise has been carried up to and connected with the most southern workings on the sill floor of the 1600 level. 1750 level: The southwest drift from the main west drift has been extended to 256 feet, showing quartz of low assay value. There has been extracted during the week from all parts of the mine 1611 tons of ore, which was shipped to the Eureka mill. Average assay value of all the ore worked at that mill during the week (1575 tons), was $19.10 per ton.

OPHIR.—West drift, 1300 level, is extended 51 feet in low-grade quartz. Assay value of bullion shipped to the Carson Mint, $32,205.

SIERRA NEVADA.—The southwest drift, 630 level, has been advanced 47 feet in a soft porphyry formation, showing some seepage of water.

UNION CON. — East crosscut No. 2 from the north lateral drift, 1465 level, extended 25 feet—total length 210 feet, still in hard porphyry.

MEXICAN.—On the 1465 level an east crosscut, No. 1, has been started and advanced 26 feet io a soft porphyry formation.

OVERMAN.—During the past week extracted 364 tons and 1000 pounds of ore. Bar sample assays average $19 per ton. Shipped to the Brunswick mill 378 tons 930 pounds of ore. Battery samples average $43.85 per ton. Northwest drift on 1100 level has been extended 16 feet through good ore running from 4½ to 5 feet in width. Total length, 84 feet. Have timbered 25 feet of the southeast drift. Have resumed work in the northeast drift 54 feet above the 1200 level.

SAVAGE.—During the week hoisted 836 cars of ore from the 500, 600, 750 and 1300 levels. Shipped to the Mexican mill 460 tons of ore and to the Rock Point mill 384 tons. Milled during the week 820 toos, the average battery assay of which was $20.63 per ton. Have bullion on hand amounting to $53,696. Southwest drift, 1300 level, advanced a total distance of 156 feet; face in fair-grade ore.

HALE & NORCROSS.—Prospecting and development work on the 800, 900 and 1100 making usual good progress with no change of importance to mention. Have nearly completed the repairs in the north compartment of the vertical shaft to the 1300 level; have finished the station and expect to resume work below this level io the iocline during the coming week.

CHOLLAR.—The upraise 60 feet south of north line, 800 level, is up 62 feet in hard porphyry. During the week have been excavating for a chute on the 1300 level. Extracted aod sent to mill during past week 438 tons of ore, average battery assays $21.41.

POTOSI. — East crosscut 50 feet north of the winze station, 1130 level, is out 21 feet, the last 10 feet in quartz giving fair assays. East crosscut 50 feet south of the winze station, 1180 level, is out 24 feet, and has passed through several streaks of quartz giving fair assays. The 1230 winze station is about completed.

UTAH.—725 level: The maio south drift has been extended 56 feet; total length, 769 feet. Formation, soft porphyry showing some clay.

GOULD & CURRY.—The oorthwest drift on the 200 level has been extended to 15 feet. Formation, quartz showing some value. Oo the 250 level east crosscut No. 1 has been extended to 30 feet. Formation, quartz of fair quality. On the 400 and 450 levels from the old stones have extracted 45 toos of ore of fair quality. On the 625 level all work has been confined to repairs.

BEST & BELCHER.—On the 800 level west crosscut No. 2 has been cleaned out and repaired 120 feet; total distance, 220 feet. On the 1200 level all work during the week has been confined to repairing the north drift.

ALTA.—Crushing 315 tons weekly of $18 rock, as per battery samples. The stopes are yielding as usual, and the raise and drifts above the 725 level are looking promising.

CON. IMPERIAL.—Exploration aod ore prospecting work go forward as usual on the 450, 750 and 1000 levels. The face of the various drifts and crosscuts shows porphyry and quartz of no value.

YELLOW JACKET.—Shipping 78 tons of $18 ore daily to the Brunswick mill and doing extensive prospecting work throughout the mine.

SILVER HILL.—Drifting on the 160 and 334 levels io hard porphyry.

KEYES.—Two new hoilers are being put in and the machinery arranged for active resumption of work in the mine.

SCORPION.—Southwest drift on the 600 level still running in porphyry with clay seams showiog no change.

CONFIDENCE.—General repairs throughout the mine preparatory to prospecting for ore are still going on.

WARD COMBINATION SHAFT.—East drift from the 1800 station is out 675 feet; face in quartz and porphyry.

CHALLENGE CON. — The joint Confidence aod Challenge west drift on the 1000 level is out nine feet, face in a mixture of quartz and porphyry. Joint Challenge-Imperial west crosscut No. 1 on the same level is out 28 feet; face in porphyry. Joint Yellow Jacket and Challenge east crosscut No. 1 on the 1000 level is out 50 feet; face shows porphyry. Joint Confidence-Challenge north drift on the 300 level is in 42 feet; face in quartz of no value.

SEG. BELCHER.—The north drift on the 850 level is steadily advaocing with its face in low-grade quartz.

ALPHA.—East crosscut, 600 level, is out 143 feet; face in quartz giving fair assays.

EXCHEQUER.—Drifting and crosscutting on the 500 and 600 levels, making good progress; faces in quartz, clay and porphyry.

CON. NEW YORK.—Drifts north on the 650, 800 and 1100 levels running io porphyry, except the latter, which shows streaks of low-grade ore.

KENTUCK.—The 1000 level east drift has been extended to 10 feet; face in porphyry. It is the intention to connect this drift with one now being run from Crown Point. Face of west drift on same level is io a mixture of clay and quartz. The south drift on the 950 level is out 22 feet in low-grade quartz.

WEST CON. VIRGINIA.—The repairs to the shaft are rapidly progressing preparatory to deeper sinking.

ANDES.—North drift on the 420 level advanced during the past week 18 feet. Formation principally quartz. South drift from west crosscut No. 1 was extended 10 feet; formation porphyry and quartz.

BELCHER. — Usual prospecting work reported. Shipped 275 tons of $22.14 ore, as per battery assays.

CROWN POINT.—The southwest crosscut on the 1100 is out 28 feet, having been extended 17 feet during the week. It is still in old ground. Shipped to the Mexican mill 380 tons of $12.54 ore, as per battery samples.

OCCIDENTAL CON.—The stopes on the 350, 400 and 450 levels are yielding 40 tons daily of fair-grade ore. The crosscut on the north line, 650 level, is in 25 feet, showing some low-grade ore. During the week the mill has worked 270 tons of ore of the average value of $21.10 per ton.

Hawthorns District.

NOTES.—Walker Lake *Bulletin*, Nov. 5: The ten tons of ore shipped by Benj. Curler from his mine beyond Luning, and which was worked in the Franklin arastras above Dayton, yielded $25 a ton. The branch railroad to the Cottonwood camp is completed and the force of workmen discharged. Already several hundred cords of wood have been hauled down. Manager Hooper of the Garfield mines is at the front, where important work is being done. They are working in favorable ground, with good indications for an important strike.

Candelaria District.

GOOD ROCK.—About 200 tons of custom ore have been crushed at the Mount Diablo mill at Sodaville recently, and the average of the rock has been $180 per ton. This mill always gives satisfaction to customers.

STAMPS IDLE.—The stamps are all hung up in Belleville, owing to a cave in the big Stedefelt furnace. The pans in the lower mill are going, and the stamps will be turned loose when the furnace is repaired.

White Pine District.

ABOUT HAMILTON.—*News*, Nov. 8: Ex-Governor Blasdel returned here from Hamilton last week and left for Reno and San Francisco. We learned from him that prospects in that locality are reviving, and there are no idle men there. The revival is mainly due to the low rate charged for the treatment of ore. Very promising new developments and a oumber of strikes of rich ore have beeo made. The base metal range is opening up and arrangements are being made for leaching the ore next spring. Supt. Kendall is getting out 10 tons of ore from the Ward Beecher and Edgar mines to have treated, as an experiment, by the Russell process, at the Marsac mill, Park City, Utah. Should the experiment prove successful, works for treatment of the ore by that process will be put up near Hamilton next spring.

Plochs District

ESTIMATING TONNAGE.—*Record*, Nov. 1: Mr. Henry F. Wild, a practical mining mao of large experience, whose headquarters are at Boise City, Idaho, is among us examining the various mines in this vicinity, more particularly the Pioche Con. Co.'s group. He comes io the interest and at the request of the management of the U. P. R. R. to estimate the probable output of ore with reference to daily shipmeots when the road now in course of construction to this place shall be completed. It is the intention of the U. P. Company to finish the Pioche branch at any rate, but the amount of traffic immediately ahead will determine them whether to push the work with some haste or allow it to lie in its present state an indefinite length of time. Mr. Wild's report goes directly to headquarters, and will have great weight with the directors. The mines of the P. C. Co. all look well, and there is no reason to believe that Mr. Wild's report will he other than favorable.

BRISTOL.—Bristol, but a few years ago bustling with business and for several years past practically deserted, is experiencing a little more life. Jesse Orwin, who has heen chloriding the old furnace dump for the P. C. Co. for the past year, has out about 2000 tons of good slag for shipment. Before shipping here it is calcined and works much better for it. The stone coal-kilns built there by Devine & Co. years ago are in use again by the P. C. Co. Wood is hauled from the surrounding mountains for which the company pays $4.75 per cord delivered at the kilns. It is theo burned in the kilns and the product hauled to town here. W. J. Roe is engaged in hauling from that point oow.

DAY AND ONONOAGO.—Fifteen teams are steadily hauling ore from the Day and Onondago mines. About 20 tons from the Day aod 5 tons from the Onondago are shipped daily. The Onondago is said to be looking much better oow than when the present company purchased it in June last. T. Williams, foreman at the Day, says the mine is opened up in such shape that 125 tons of ore could be extracted daily from the works above the tunnel level, if necessary, without difficulty.

HIGHLAND.—The steam hoist at the Mendha mine, Highland, is completed and was expected to go into operation yesterday. The opening up of this mine will go ahead rapidly when the hoist is fairly at work.

ARIZONA.

THE BAUMAN MINES.—Our agent in Arizona has recently examined the Bauman group of mines in the Agua Fria district, 15 miles east of Prescott. This group consists of ten full mining claims, each one measuring 1500 feet along the vein, by 600 feet in width. They are located upon different ledges of copper, silver, and gold-bearing quartz. The Agua Fria district is named from the adjacent valley with a similar title, which valley is thickly settled by ranchers and cattle-raisers. The mountains (or hills) in which the mines in question are located are a southern spur of the Black Hills. The famous United Verde copper-silver mines are located in these Black Hills. Very good wagon-roads lead to the Agua Fria district, thus making it one of the most accessible mining camps in Northern Arizona. The rock formation in the Bauman mines is identical with that in the other mines of this great mineral belt, which extends from the Bradshaw mountains (30 miles south of Prescott) through Big Bug and Agua Fria districts, and ends in and with the Black Hills. Successful mining is carried on throughout this vast zone, in several instances, on a large scale, especially in the Big Bug and Black Hills districts. The well-known metal-broker firm of Phelps, Dodge & Co. of New York (Prof. Douglass, Pres.) are the principal operators in Big Bug, extensively developing the Hackberry and Boggs mines; and in the Black Hills it is Hon. W. A. Clark of Butte, Montana, who very successfully operates the rich United Verde mines and smelters at Jerome. The Bauman group lies between the two localities just named, and is in the same mineral belt. These mines are only partially developed, but so far as operations have been extended the indications are excellent. The strongest and most important vein in the group can be traced for several miles over mountains and across ravines. Four claims are upon this lode. The ledge measures about 25 feet in width, dips to the east at the rate of six feet in ten, and is inclosed in porphyry walls. Five hundred yards west of this is another ledge upon which there are two locations. Two hundred yards farther westward is a large dyke of quartzite on which is another location. The eighth location is upon another parallel vein one-half mile west of the first-named or mother lode, while the two remaining locations of the group are upon spurs running eastward from the mother lode. Sampling tests of ore taken from the different locations show that the rock carries gold, silver and copper, the former metal running as high as $33.50 per ton, with a small percentage of the two other metals; then again carrying as high as 87 ounces of silver to the ton, $2 in gold, and 17.5 per cent copper; while in other cases 17 ozs. silver per ton will be found, with a trace of gold and 67.2 per cent copper. The foregoing are, to be sure, some of the highest results obtained from the working of any considerable lots of ore, but the lower grade lots which were subjected to the assayer or sampler returned results not at all discouraging. The general average of the tests indicates that there is here a safe if not a highly profitable investment for the miner and capitalist. The Bauman mines have undoubted merit, and offer an excellent opportunity for the employment of some of the capital that is now lying dormant at our centers of wealth.

BLACK ROCK DISTRICT.—This is a new district situated about 60 miles south of Prescott and 10 miles northeast of Wickenburg, in Yavapai county. The best-defined ledges in Arizona are situated in this district. The Slim Jim group, situated at the head of Slim Jim canyon, is rich in gold and copper. The ore body, 6 feet wide in the Slim Jim, averaged $25 in gold and 16 per cent copper. Other ledges of the group, of which there are four, make equally as good a showing. These mines are owned by Ashtoo & Mahoney. The Amazon, a group of ten mines 20 to 60 feet wide, averaging $12 gold and a fair per cent of copper, situated half a mile east of the Slim Jim, are owned by Groom & Wade. The King Solomon, a four-foot vein of $20 free gold ore, owned by the same parties, are a few of the mines of this district. Very little development has been done in the district, the ore being too low grade to ship. By spring many of the mines will be opened in good shape.

ALASKA

TO BE EXPLORED.—*Alaskan*, Oct. 30: A bill providing for the exploration of Alaska has been placed on the calendar of the House of Representatives. The bill, as reported from the Committee on Military Affairs, provides for stationing and maintaining a detail from the army in the heart of that Territory for a sufficient term of years for the purpose of exploring the resources of that section, and appropriates $100,000 for the payment of expenses. Its passage is urged by Western miners, who hold the firm belief that Alaska is rich in mineral wealth, and who wish to use the military establishment as the base of operations.

GOLD PRODUCT.—Lyman E. Knapp, the Governor of Alaska, in his annual report, shows that among the exports during the last year was gold (estimated), $2,000,000; all other exports sufficient to make the total $9,840,730. He states further that considerable activity has been manifested, but no excitement in connection with the various mining interests.

COLORADO.

DEEP MINING IN COLORADO. — *Register-Call*, Nov 6: The deepest mine in Colorado is the New California Mining Co.'s shaft on Quartz hill in this county, which has attained a depth of 2045 feet. Good pay and a strong vein have been encountered in the 2000-foot west level. The manager of the property, Mr. Alfred Rickard, has persistently worked this property, while many others would have closed down. He is now making preparations for sinking an additional 200 feet, which will give a depth of 2245 feet. To Mr. Rickard belongs the credit of demonstrating the fact that deep mining pays in Colorado.

FROM IDAHO SPRINGS. — Denver *Republican*, Nov. 7: The Idaho sampler and concentrator and the Chamberlain & Co. sampler are both busily engaged in treating the ores in this and adjacent camps. The Mixsill stamp mill is proving a source of wealth to the owners. Frank Fitzpatrick is obtaining gold in paying quantities in his placer in East Idaho. The Ohio Gulch Mining Co. is working three men on its mine in Ohio gulch. The Humboldt mill is at work, and doing satisfactorily. The Senator, at the head of Ohio gulch, is at present producing more ore than any of the mines in the Dumont section. The Champion Dirt, on Trail run, is producing its regular quota of gold and silver. This is the property of J. Alden Smith, Ex-State Geologist. The Jo Reynolds still keeps up its wonderful production of rich silver ores. The company employs 65 men at day's pay. Besides these, there are 20 leasers. The shaft is 600 feet below the tunnel level, making 1000 feet in depth from the surface. The ore in the bottom is stronger than above and is of as good grade.

IDAHO.

COEUR D'ALENE MINES.—Wardner *News*, Nov. 1: On Tuesday last two important sales of mining property were consummated at Spokane, consisting of a half interest in the Union mine, near Burke, for $100,000, and a similar interest in the Cleveland, at Gem, for $75,000.

A NEW DISTRICT.—Idaho Co. *Free Press*, Nov. 2: Messrs. Troutman, Kempf and others were out from Elk City during the week and had some magnificent specimens of ore from their quartz mines on Red river. This district is one of great promise, and at the present rate of development it will speedily assume prominence.

NEW MILLS.—Idaho *World*, Nov. 4: The Idaho Gold Mining Company's mill at Bonanza, Custer county, is completed and running. Wm. Libby has had seven and one-half tons of ore from the old Chickahominy ledge crushed in the Forest King mill. The cleanup was made last Wednesday. The gold had not been assayed when we went to press, but it is estimated by auriferous experts that the amount, 150 ounces, is worth about $2000. The ore, therefore, ran over $200 per ton.

SEVEN DEVILS DISTRICT.—Salubria *Citizen*, Nov. 6: Another big deal in the Seven Devils is reported to have been closed the first part of this week, The Copper Key, belonging to Charles Anderson and Al. Donart, was purchased by Boston capitalists for $12,000, There has been in the neighborhood of $2,000,000 worth of property sold in the Seven Devils this season alone, and we are informed that a big deal will soon be closed and made known to the public.

POORMAN.—The Poorman made connections with the air shaft Monday noon. A few days' time in timbering the upraise will finish this work, after which day and night shifts will be put on to drive the main tunnel on toward the north shaft. When this point is reached the mine will be in good shape to work a large force of men. In the meantime, all ore extracted is being stored in the ore-house.

LOWER CALIFORNIA.

ALAMO NOTES.—*Lower Californian*, Oct. 30: Russell & Rhodes are jubilant over the find in the Aurora, where, in a space of 5x7 feet, was extracted in two days over $2000. The brick is a beautiful specimen. They cut through a dyke of porphyry and were rewarded by the discovery of a fine vein wider than that above and much richer, in fact the rock ran by mill test over $300 per ton. The Princesa mine adjoining is also in honanza and the Princesa millrun this month shows the result. The Indio and Ulises are starting up and adding their quota. It is wonderful how the idiotic idea of a princely two-strike in the Ulises gained ground. There was no such thing, though the mine is fairly rich, and there is no telling what is hidden below. The Montezuma mine and mill are booming. New contracts have been let to extract ore from several parts of the mine. The mine is fast coming to the front as one of the best here. It is reported that the El Paso Co. will start up in 10 or 12 days. A lead on the Indio mine has stopped working, but will start up as soon as a pump can be put on. Ben Funk reports that his labor in the Rich gulch placers yields him from $5 to $15 daily. Other placer mines are doing almost as well. The Lizalda silver mine near the boundary line is giving good results and developing into a fine property. Enterprising Mexicans and Americans compose the company that owns it. The mine is thought to be on the same mineral belt as the rich Sueño.

MONTANA.

A CONCENTRATOR NEEDED. — Boulder *Age*, Nov. 5: The large quantities of ore lying on the dumps of the various mines within a radius of from two to five miles of Boulder is good evidence that a concentrator is badly needed here.

THE DODGE MINES.—The White Dog mine in the Bigfoot district is making an exceedingly good showing. A tunnel is being driven along the vein and is now in about 50 feet. The ore body varies from four to seven feet in size and is of excellent quality.

THE CHAMPION MINE.—The *Silver State* is authority for the statement that a shoot of ore surpassing in extent and richness anything ever struck in the mine has been encountered in the Champion in Oro Fino district.

A NEW SMELTER.—Butte *Miner*, Nov. 6: Articles of incorporation of the Helena Mining & Smelting Co. were filed a few days ago with the Secretary of State at Helena. The capital stock of the company is $3,000,000, divided into 300,000 shares of a par value of $10 each.

REORGANIZED.—The Silver Crown Co., operating in Oro Fino district, has been reorganized and is now called the New Silver Crown Mining Co., with 500,000 shares of stock of a par value of $1 per share.

IMPORTANT STRIKE. — *Montana M. Review*, Nov. 5: A very important strike was made in the Boulder Chief mine, located near the Penn Yan and Bluebird properties, in the Cataract country. In a crosscut run from the 250-foot level, five feet of high-grade ore was struck on the hanging-wall. Five assays made from the new strike gave returns as follows: $96.06, $121.76, $62.77, $147.24 and $82.88.

NEW MEXICO.

LORDSBURG.—*Western Liberal*, Nov. 1: Superintendent Catchings of the Humboldt company informs the *Liberal* that Noel May, who recently experted the company's property here, is on his way back from Memphis to erect a leaching plant the material for which has been ordered. The plant is similar to the ones used at Swansea, Wales, the great head center of metallurgy. New life is to be infused into the affairs of the Arizona Copper Co., a Scotch corporation.

FROM VARIOUS CAMPS.—*Western Liberal*, Nov. 7: A portion of the machinery recently purchased by the Standard Mutual Mining Co. has arrived and the balance is expected within the next 30 days. A. Applegate has some beautiful specimens of concentrates made by a new machine which is working at Denver. The machine separates by centrifugal motion and works very fast and close; one of the specimens run about $700 per ton and was concentrated from slag from one of the smelters which was worth about $1 per ton. The machine works very cheaply and bids fair to make a big change in milling operations. A. Applegate, superintendent of the Chilidema Mining Co. arrived home from Kansas City and Denver last Saturday. Mr. Applegate informs the *Liberal* that a milling plant with a capacity of about 100 tons per day, has been ordered. The plant consists of Cornish rolls for crushing with jigs for concentrating. The ore has been successfully tried on the machinery. The jigs save the heavy values successfully. The light values, principally silver, will be saved by slimers. Just what variety of a slimer will be used has not been determined, as the company is waiting the results of certain experiments now being made in Denver. The machinery will all come from Denver, where it is now being manufactured. Mr. Applegate intends to begin immediately to sink a three-compartment shaft as the main working shaft. He will put on three shifts and expects to have it down so that it can be used by the time the machinery is in position, which will be in about 90 days. This will be another large company working in Lordsburg, the mines being about three miles from town, and will add largely to the business of the town.

UTAH.

DENVER CAPITAL IN UTAH.—Salt Lake *Tribune*, Nov. 1: Several prominent Denver capitalists are making arrangements to begin operations in the silver-lead mines in the Tintic district in Utah. Nothing definite has yet been given out, but it is stated the enterprise is to be conducted on a large scale.

TINTIC ITEMS.—A big mining deal was made in Eureka on Thursday last, Hon. W. H. Smith, superintendent of the Bullion-Beck, and J. F. Knapp of the *Tribune* purchasing an extension of the Bullion-Beck property. It lies immediately adjoining the Centennial-Eureka on the west and about 100 feet from the Eureka Hill properties on the south. It is called The Ranger, and is said by all the miners in the district to be one of the best properties in Tintic. A strong miners' union has been organized in this camp, and it is expected that in two weeks the membership will be at least 500. The objects of the union are commendable, being the protection of its members, the bettering of their condition, and the making of arrangements whereby the sick and needy in the Order will be entitled to and receive proper care and attention. The richest ore body in the Centennial-Eureka—that on the 300-foot level—is now 18 feet wide and constantly growing wider. On account of the richness of this ore and of the fact that their storehouses are all full of ore, no more will be shipped until silver advances. The Centennial-Eureka is one of the greatest properties in Utah.

DEEP CREEK COUNTRY.—Messrs. F. W. Wampler and G. D. Shell returned yesterday from the Deep Creek country loaded down with enthusiasm over the situation out there. Fine ore finds are reported in many localities, while at Gold Hill ore is being turned out, assaying, it is said, $1000 gold to the ton. The railroad cannot get out there any too soon. A great traffic awaits it.

WASHINGTON.

THE CASCADE MINERAL RANGE.—Seattle *Press*, Nov. 8: There is no better known mining expert in this section of the country than Prof. Chas. F. Blackburn, whose opinion carries weight in any mining circle. He has been investigating the Cascade region thoroughly, and as the result of his conclusions addresses the *Press* the following communication: "Having spent seven months in the Cascades engaged in prospecting and developing mines, I am prepared to announce that our mineral resources are immense. Millions of dollars are going to be realized from the mines of this grand old range. The mines are here. They are numerous and rich. I have seen large veins of gold, silver, copper, lead and iron right here in King county. The veins are both true fissures and contacts. Some are large and well defined. They contain the metal in good-paying quantities. There is every indication of these ledges being permanent. The formation is slate, granite, porphyry and gneiss, with other crystalline and metamorphic rocks. I am speaking of the Snoqualmie district. In this region there are also some igneous or eruptic materials. The latter is usually in dykes. There are a few extinct volcanic craters. The absence of fossiliferous or sedimentary formations is remarkable. Especially is this so in the range proper. There may be such strata in the coal region along the lowest foothills. Archæan granite exists here in mountain masses. The latter is the oldest rock here found."

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Modoc and Lassen Cos.
T. B. LESIEUR—Humboldt Co.
GEO. WILSON—Sacramento Co.
J. P. QUINETTE—San Francisco.
J. C. HOAG—San Francisco.
SAMUEL CLIFF—Creston, Cal.
W. W. THEOBALDS—Kern and Tulare Cos.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
W. B. FROST—Marin and Sonoma Cos.
GEORGE EVANS—Santa Clara Co.
MRS. M. E. DUDLEY—Ventura Co.
ANDREW REID—Monterey Co.
B F. BELT—Shasta Co.
FRANK S CHAPIN—Colusa Co.
WM. M. HILLEARY—Oregon.
HENRY STACEY—Oregon.
WM. HOLDER—Oregon.
R. G. HUSTON—Montana.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING NOV. 4, 1890.

439,992.—TREADLE PUMP — W. H. Anderson, Riverside, Cal.

439,832.—OPERATING KEYS OF GAS CHANDELIERS—R. F. Bridewell, S. F.

440,003.—WRENCH — W. S. Bunch, Marshfield, Ogn.

439,741.—WIRE SUSPENSION BRIDGE — H. C. Carmack, East Portland, Ogn.

439,812.—MINING—J. W. Crites, S. F.

439,933.—DITCHER AND CULTIVATOR — O. T. Davies, Brighton, Cal.

439,744.—DUST PAN ATTACHMENT — Dean & Earle, S. F.

439,815.—BARREL STAND—H. H. Fisk, Florence, Ogn.

439,649.—CIGAR HOLDER—A. Fritschi, Suisun, Cal.

439,940.—OPERATING ELEVATOR GATES — W. H. Golder, Portland, Ogn.

439,941.—STATION INDICATOR —L. Goldstone, S. F.

439,820.—MACHINE FOR MAKING SHELLS—Chas. D. Kennedy, California City, Cal.

439,959.—TELEGRAPH KEY—W. A. J. Kohrn, S. F.

440,047.—HARROW—H. L. Mack, Ellensburg, Wash.

439,966.—YARN-DYEING APPARATUS—W. Maybury, Pasadena, Cal.

439,823.—OPERATING SHUTTERS FOR ELEVATOR SHAFTS—Ranlet & Provost, S. F.

439,687.—WASH-BASIN DISCHARGE — J. W. Reid, S. F.

439,897.—CAR COUPLING—P. W. Ross, Los Angeles, Cal.

439,902.—HOSE COUPLING—F. E. Sharon, S. F.

439,982.—CAR COUPLING—J. L. Stillman, Fresno, Cal.

439,929.—RUBBER SHOE — John Taggart, San Diego, Cal.

439,755.—WINE-SCHOONER—L. Wagner, S. F.

439,989.—CHAIR ATTACHMENT—A. M. Whiteley, Sacramento, Cal.

439,917.—WATER BACK FOR GAS STOVES—W. H. Wiester, S. F.

The following brief list by telegraph for Nov. 11, will appear more complete on receipt of mail advices:

California—Louis Benussi and K. and C. Dondero, S. F., preservative; William C. Dillingham, Los Angeles, combined job and news galley; William Fay, Oakland, carpet-cleaning machine; William H. Ounsolus, Sutter Creek, water-wheel; Silas Harris, S. F., upsetting machine; Byron Jackson, S. F., centrifugal pump; Willie C. Keithly (assignor of one-half to J. Farnham), S. F., adjustable picture-frame hanger; Ellsworth D. Middlekauff and C. D. Harsin, Stockton, gate; William W. Sherman, S. F., self closing gas-burner; Henry Thihault, S. F. sickle-grinder.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

MACHINE FOR CUTTING BOARDS.—James Birney Burrell, Wrights, Cal. No. 439,321. Dated Oct. 28, 1890. This machine is intended for cutting wood into slabs or boards, and more particularly for cutting boards from logs. It consists of a fixed guide rail, a carrier mounted and adapted to be reciprocated thereon, a bit or knife mounted on the carrier and a means for feeding the bit or knife at each stroke, consisting of a nut on top of the vertically movable plate which carries the bit or knife, a screw seated in the nut, a ratchet-wheel on the screw and racks at each end of the machine for engaging the ratchet-wheel. It also consists in the novel double-ended knife or bit having planing points at each end and intermediate scoring edges which extend below the horizontal plane of the points, so that they will score the wood on the previous movement of the knife before the planing points cut the shaving out. It also consists in novel adjustable dogs for holding the log.

MACHINE FOR MAKING SHELLS.—Charles D. Kennedy, California City, Cal. No. 439,820. Dated Nov. 4, 1890. This machine is adapted for making paper shells especially. These shells form the receptacles in which powder is packed. In operation, the machine rolls the paper into cylindrical form, twists one end to form the shell bottom and then removes and discharges the completed shell. The essential parts of the machine are a rotating hollow former about which the paper is wound into a cylinder, a twister at one end which seizes and twists the end of the cylinder to form a bottom, a sliding push-rod operating within the hollow former and against the inner side of the shell bottom, and a sliding push-bar which presses against the outer side of the bottom whereby the shell is held between the two and thus slid off the former.

DEVICE FOR OPERATING KEYS OF GAS CHANDELIERS.—Richard F. Bridewell, S. F., Cal., assignor to David McKay, E. F. Badgely and Mary B. Bridewell, all of same place. No. 439,832. Dated Nov. 4, 1890. This device is especially intended for chandeliers having electric lighters and extinguishers. Its object is to provide simple and effective means for lighting the gas of the whole chandelier by a single movement and at once. It consists of a central turning key, slide-rods connected therewith and operated thereby, and connections between the outer ends of the rods and the burner keys, whereby said keys are all simultaneously operated by the movement of the central turning key.

Let Us Know

If you fail to get this paper. We prefer to send missing Nos. Write soon and to the office direct. It is important that we should know when the paper miscarries.

MECHANICAL PROGRESS

HOW METAL WARES ARE COLORED.—Small metallic articles, buttons, clasps, buckles and others, have different colored films produced on them by various methods. Some of these are known as oxidized silver. Rainbow colors are produced on brass buttons by stringing them on a copper wire and dipping them in a bath of plumbate of soda, freshly prepared by boiling litharge in caustic soda, and pouring it into a porcelain dish. A linen bag of finely pulverized litharge or hydrated oxide of lead is suspended in the solution, so as to keep up the original strength of the solution. While the buttons are in solution, they are touched one after the other with a platinum wire connected with the positive pole of a battery, until the desired color appears. The galvanic current employed must not be too strong. The colors are more brilliant if they are heated after they have been rinsed and dried. Colored films are more conveniently produced upon bright brass by different chemicals, by painting with them, or by immersion. For example: Golden yellow.—By dipping in a perfectly neutral solution of acetate of copper. Dull grayish green.—Repeatedly painting with very dilute solution of chloride of copper. Purple.—Heating them hot and rubbing over with a tuft of cotton saturated with chloride of antimony. Golden red.—A paste of four parts of prepared chalk and mosaic gold. In covering an article with any colored bronze in powder, it is first rubbed with a very little linseed oil, and the bronze is dusted evenly over it from a dust bag. It is afterward heated in an iron pan to about 480 degrees Fahr. In recent times, small articles are also roughened by dipping in strong nitric acid, and, after washing and drying, they are coated with a rapidly drying alcohol varnish that has been colored yellow with picric acid, red with fuchsine, purple with methyl, violet or dark-blue with an aniline blue. This gives the desired color with a beautiful metallic luster. These colors are not very durable and are for inferior goods.—*Ex.*

LACK OF APPRECIATION BY EMPLOYERS.—The lack of a proper degree of appreciation on the part of an employer is not only an injustice to faithful and interested workmen, but is an injury to himself as well. It costs nothing, but is a good investment, even at the price of an occasional reward, and is the least that might be expected when it is deserved. An exchange says: "A skilled mechanic who has worked out and perfected several devices for turning out an increased amount of superior quality of work, and who has presented said devices to his employer, recently remarked to the writer: 'I have lost all interest in advancing the work of this shop; my sole ambition is to put in ten hours per day and draw my pay Saturday night. I am all done with the idea of trying to advance the interests of my employer by brain labor on improved methods of doing work. The firm has several devices which save it many hundred dollars per year. I have received several kicks but no thanks in connection with these matters; therefore I am done.'" As before stated, this mechanic is a good workman, an intelligent man and a practical inventor. He was driven to the course described by the lack of appreciation on the part of his employer. Such a course does not pay. If a man interests himself in your business sufficiently to give his time and brains to further the work, at least appreciate the man's efforts, and make him feel that you are under obligation to him, even if he receives no pecuniary benefit. The man who is capable of devising a labor-saving operation or appliance may bring forth many more of the same kind if he is given encouragement. An employer should care at least enough for his own interests to give the workman all the appreciation which he deserves.

AMERICAN RAZORS BECOMING POPULAR.—There is generally much prejudice among Europeans, both at home and in this country, against American razors; but this feeling is gradually wearing away both here and abroad. Many hardware articles of American manufacture are now accepted in Europe in preference to home manufactures. In this country the best razors and knives no longer come from Sheffield. Even Englishmen, says the St. Louis *Globe-Democrat*, are alive to this fact. "The best customers for American razors are of English and German descent, as very few Germans or Irishmen act as their own barbers. Formerly, nothing without a genuine or fraudulent Sheffield trademark cut into the blade would be looked at by an ex-subject of Queen Victoria, but now American goods are generally preferred, and some Eastern makes are very popular. The greatest run the last two years has been on a razor with a distinctive military name, and, although I have sold a great many of the kind, I don't know where they are made. But the fact is immaterial, for no purchaser ever finds fault with anything connected with one in any respect save price, and even that is not seriously objected to."

NEW TEXTILE MACHINERY.—Quite an interest, it is said, is exhibited abroad in a machine recently brought forward for effecting successively all the four processes of treating textile fibers, such as flax, hemp, etc. The flattening process is accomplished by means of the combined action of a single feed roller and a large central fluted cylinder, the feed roller being also fluted, the flutes being so arranged as to meet those of the central cylinder, without gearing between them; in some cases, as in the decortication of ramie in the dry state, the feed roller may be provided with spiral flutings, instead of the ordinary plain pattern. After having been straightened, the fibers are passed between a series of fluted rollers and the central cylinder, in order that their woody parts may be broken, the flutes of the small and large rollers working between each other. At the conclusion of this process, the fibers are passed directly downward between two pairs of scutching drums driven at high speed; the interlap of the blades of the drum is adjustable, increased or diminished according to the tenacity of the material. When the fibers are in a green state a jet of water falls upon them while they are passing between the scutchers, or, as in the case of long hemp fibers, endless aprons are employed, having a series of combing teeth. For the driving mechanism, a driving pulley and large spur-wheel are attached to each other; and mounted to run loose upon the axle of one of the scutching drums, the spur-wheel gearing into pinions upon the other shafts.

ALUMINUM FOR IMPROVING STEEL.—Some difference of opinion seems to exist as to the value of aluminum for improving the quality of steel; but Sir Frederick Abel, in describing the experiments in this direction recently made by several well-known gentlemen, says: "The influence of aluminum, when used in small proportion, upon the properties of gray and white cast iron, is of considerable interest, especially its effect in promoting the production of sound castings, and in modifying the character of white iron in a similar manner to silicon, causing the carbon to be separated in the graphitic form. The probable beneficial connection of aluminum with the industries of iron and steel naturally directs attention to the great practical importance, in the same direction, which has lately been acquired by certain other metals, which, for long periods succeeding their discovery, have either been only of purely scientific interest and importance, or have acquired practical value in regard to their positions in a few directions quite unconnected with metallurgy. Thus, great interest attaches to the influence of the metals manganese, chromium and tungsten upon the physical properties of steel and iron."

AMERICAN STEEL IN EUROPE.—A gentleman who represents a firm of Pittsburg manufacturers of fine steel, has gone to Europe to arrange for the shipment and sale of this material to European consumers. The house in question established a branch in London some two years ago, and has been selling more or less of its products in Europe ever since. This agent will locate other agents in the leading trade towns in Great Britain and on the continent. An agency will be opened at Paris, and probably one at Hamburg. The *Dispatch* argues that although it may cost $10 a ton to ship fine steel to London, its quality will be such as to assure its sale in competition with the home product. It is chiefly owing to the superior quality of the steel from which American chisels, axes, knives, planes and other edge tools are made, that they command the preference in Australia, New Zealand and South America, at comparatively high prices, over the like manufactures of England and Germany.

STEEL CAR-WHEELS.—The following test of steel car-wheels, made by the American Steel Car-Wheel Co., took place recently at Boston, in the presence of several prominent railway superintendents: A 33-inch car-wheel was placed on two solid iron blocks, rim resting on each block. A weight of 525 pounds, falling at a hight of 17 feet, struck the hub 25 times without any effect except battering the metal. It was then dropped 10 times on the rim without a fracture. Then a weight of 1400 pounds was tried, falling at a hight of 17 feet, struck the wheel 11 times, but failed to break it, showing it to be practically indestructible. At another exhibit, in order to test the expansion and contraction of the metal, a wheel was buried in sand and a charcoal fire built around the tread until it was brought to a red heat. Then it was taken out and exposed to the atmosphere, which had no effect on it whatever. This demonstrates that the wheel is a safe one. These wheels are in extensive service.

THE GIFFARD GUN.—It is reported that Colt's Armory at Hartford has secured the American rights for the Giffard gun, recently described in these columns, in which the magazine consists of a strong steel tube filled with carbonic acid gas, liquefied by pressure. When the arm is fired, the mechanism admits a drop of this liquid to the barrel behind the bullet, and the expansive force drives it out at a speed exceeding that attained by the use of powder, and with several other advantages of its own. It is said that $1,000,000 was paid for the American rights to the gun.

THE CAR WORKS all over the country have advanced the prices of building passenger coaches. A coach which was built a year ago for $5200, the works will not build now for less than $5500, and the car works are steadily advancing the price of box and coal cars.

THE JERUSALEM-JAFFA RAILWAY has just been equipped with three locomotives made at the Baldwin Works in Philadelphia. They arrived at Jaffa on Sept. 22d. Thus the first locomotives used in this ancient land are made in the New World.

SCIENTIFIC PROGRESS.

Mind and Matter in Science.

In whatever department of thought we find it occupied, science is hostile to uncertainty. All that is fully accepted must be capable of proof, and anything that cannot be thus verified is not accepted as science. Of course, most things have reached the acceptable, as science, through conjectures, doubts and the most careful efforts at verification. Such is the road over which most that is now recognized as science has traveled.

The beginnings of science have their mutable facts, tentative theories and conditional or provisional acceptances. Modes of thought, charitable consideration and time for conclusions must be allowed, or there would be no progress in science. The true searcher after truth—the earnest science-builder — should give reasonable consideration to all propositions, however crude or apparently unphilosophical. It is only by such a method that propositions can be planned, arranged, recast and slowly matured until they can be either cast aside as worthless or safely accepted as progress in science.

"Science and philosophy," says a writer in the London *Lancet*, "it must be remembered, are not contraries. They are merely the obverse and the converse of the same intellectual process, the former objective, the latter subjective as to its rational method. Either may, in the wider acceptation of its meaning, be taken to include the other, and it is only the prominence of one, the physical application of scientific study, which has associated the former with what we call matter, as distinct from spirit or mind, the natural sphere of the latter. However diverse they may seem to be, distinction between mind and matter is, in the present state of our knowledge, impossible. We are as yet without experience or information respecting the separate condition of one or another. At all points matter is instinct with incorporated properties which constitute the law of its being, though whence derived its atoms cannot tell us; and mind, on the other hand, can only confess itself through its physical manifestations. Though we should penetrate, if it were possible, beyond the earliest known traces of our world, we might still be as far as ever from a solution of the mystery, but at no stage could we expect to pass beyond the age at which these two became united. Everywhere we still find, whether in vital activity or in the buried vestiges of world-old existence, the sure signs of cause and effect. The design may vary, but its evidences are never wanting.

"Some, perhaps, may prefer to regard it as the essential possession of matter, and to dignify this with the attributes of a creator. We cannot but think, however, that the very diversity of material forms, and their infinite variation in conformity with some discoverable purpose in each case, mark them out rather as the vehicles of some compelling force implanted in them. That this force is not purposive but fortuitous in its action is incredible. Given a certain stage in the progress of development, circumstance may, indeed, accomplish many modifications, as the laborious genius of Darwin has abundantly proved; but even these are governed by strict limitations, are apt to be transient in character, and are rather differences of degree than alterations in type. The argument for intelligent design is not seriously impaired, in our opinion, by such evidence of a merely material agency, and there is every reason to believe that this view is yearly gaining ground among the more scrupulous thinkers in physical science. It is significant to find an authority like Prof. Tyndall, despite his belief in matter and force as primary factors in the production of life, admitting the probable existence of a 'power of creation,' which he associates with evolution, and proposes to invest with some feeling akin to worship. Prof. Huxley's condemnation of materialism as 'the most baseless of dogmas' is also—at least constructively—suggestive of a disposition to include within the beliefs of natural science the existence of a supreme directing intelligence."

EELS IN VINEGAR.—Dr. G. Lindner discusses the occurrence of the "eele" in weak or impure vinegar. The worms move actively in a fluid medium, creep slowly in thick concoctions, or coil together in complicated knots. They thrive well on a diet of egg, withstand even tolerably strong vinegar, are killed at once by pure acetic acid, are very slightly perturbed by artificial digestive cultures, live well on fruits, bulbs, etc. The females reproduce viviparously or oviparously, according to the nutritive medium and the temperature, but soon die after reproduction, nor are the males long-lived. They flourish best between 60° and 80° F., are killed by a temperature over 107° F., or under the freezing point; on light and air they are very slightly dependent, but to drouth very sensitive. After desiccation for three or four hours, no revivification even of the eggs was observed. The worms have great powers of adaptation to the most diverse conditions. Their natural home seems to be in moist mud and in putridity, but they are rare in drinking or running water. That millions of germs float in the air is a fable. How they get into the vinegar is uncertain, but they probably insinuate themselves at certain stages of its manufacture. In vinegar prepared from wine by the quick process they are very rare. The "vinegar eels" are not exactly dangerous, but it is at once safe and more appetizing to make sure either that the vinegar is of the better sort, or at least boiled and filtered.—*The Microscope.*

SILVER IN VOLCANIC ASHES.—The existence of silver in volcanic ashes is of rare occurrence. Only in two cases have argentiferous ashes been met with. The first sample was obtained during an eruption of Cotopaxi in July, 1885, in the ashes of which Mr. J. W. Mallet proved the existence of one part of silver in 83,000 parts of ashes. In the following year the same investigator was able to add a second instance. In January, 1886, a violent eruption of Tungnragua, in the Andes of Ecuador, between 50 and 55 miles from Cotopaxi, took place, the eruption continuing at longer or shorter intervals up to November of the same year. The ashes thrown up by this volcano, which had been at rest for over a century, contained silver to the extent of one part in 107,200 parts of ashes. This appears, at first sight, to be only a very small percentage of the metal; but when it is considered what enormous quantities of ashes are erupted, and what a vast extent of area they cover after an eruption, the quantity of the silver thrown up with them must be considerable.

AN AID TO GEOLOGICAL EXPLORATIONS.—The Paris *Genie Civil* describes an instrument called the erygmatoscope, designed by M. G. Trouve, for the examination of geological strata pierced by deep boring. The apparatus consists simply of a powerful electric incandescent lamp, inclosed in a cylindrical case, one of whose curved sides serves as a reflector, and the other, made of thick glass, permits the illumination of the bore hole. An elliptical mirror, set at an inclination of 45° in the bottom of the case, throws its images vertically upward through the open top of the case to the observer, who examines them with a powerful telescope. It is said that the apparatus works satisfactorily to a depth of 1000 feet, and that the Portuguese Government has supplied it to its expedition that is exploring the shores of Mozambique.

A PREHISTORIC CITY.—An interesting bit of news comes from Mineral Bluffs, in the copper region of Polk county, Tennessee, announcing that laborers have unearthed a prehistoric city in that vicinity. The first discovery was that of an ancient stone wall, which the workmen traced for one mile. Remnants of dwellings and pottery were also found. An extensive mining operator, from the scene of the discovery, and who has visited the buried cities of Arizona, recognizes parallel characteristics revealed in Tennessee. The work of excavation will be continued. The improvements and industries of the age are uncovering many hidden secrets of the ancients. Even in North Chicago, last week, numerous relics of Indian manners and customs were unearthed.

MARVELS OF MECHANICAL SKILL.—Among the marvels of human skill and ingenuity exhibited by the London Mechanical and Scientific Society may be mentioned an instrument loaned by the great Armstrong Gun Works, which accurately measures thicknesses down to the one-thousandth of an inch; a similar instrument by a rival mechanic which grades thicknesses one millionth parts; a scale by Oertling, the world-famous balance-maker, which turns with the one-thousandth of a grain while loaded with 3000 grains; and an engine by a Paddington watchmaker which contains 122 pieces, not including 32 bolts and screws, and can be hidden in a lady's No. 7 thimble.

VARIATIONS OF THE MAGNETIC NEEDLE.—Camille Flammarion, in a recent letter, says: Monreanx has just determined the condition of magneticism at the Observatory of Juvisy. He has found noticeably that the declination of the magnetic needle to the west is 15° 58'. This value surpasses that of Paris, and therein we find an unexpected discovery. The geological formation of the land does not explain this anomaly. The fact of the existence of this anomaly tends to show us that the distribution of the terrestrial magnetic curves is not nearly so simple as has been imagined up to now.

MAPLE SUGAR OF INDIAN ORIGIN.—According to Prof. Mason, relics of Indian sugar troughs and various other implements of undoubted use in obtaining sugar from the sap of the maple tree have been found. The professor also says that the Indians tapped the silver maple and ash-leafed maple as well as the common maple-sugar tree. Sugar not only entered into the food of the Indians in localities where these trees were found, but many curious customs and religious ceremonies were associated with the annual gathering of sap and production of sugar.

PHOSPHO-BORIC GLASS FOR MICROSCOPES is a new kind of optical glass, which contains phosphoric acid and boracic acid, and is designed especially for the construction of object glasses. The *Photographic News* says it is asserted that by means of this new glass, lately produced in Germany, an object possessing no more than the one-eight-hundred-and-twentieth part of a millimeter can be distinctly recognized.

A LUMINOUS BUOY has been devised, the light for which is produced by phosphuret of calcium, and is visible 2½ miles away.

ENGINEERING NOTES.

Possibilities in Shipbuilding.

Sir Nathaniel Barnaby, Chief Constructor of the British Navy, in speaking of the possibilities in naval construction, says he was recently in consultation with a business man, well known on both sides of the Atlantic, in regard to the practicability of building and sailing, at profit, a steamship, 1000 feet long and 300 feet wide, with a displacement of 100,000 tons. The size of such a monster ship may be better conceived by a comparison with the Great Eastern, whose displacement was only 24,000 tons—less than one-fourth that of the one now proposed.

The ship is to be built of steel. Its size would be so great that it would neither roll, heave nor pitch in the roughest sea; it would only be subjected to a gentle undulation. The ship in fact would be a floating island. The engines would be of 60,000-horse power, and its speed 15 miles an hour.

Two difficulties would have to be overcome: Such a ship could not be launched, and would consequently have to be constructed afloat; although the ship might be so constructed as to draw only 26 feet of water, still she would be incapable of entering any dock, or of being placed alongside of any wharf to take in or discharge cargo. There would be no serious engineering difficulty in overcoming the first obstacle; to avoid the second, Mr. Barnaby proposed the following novel expedient.

He says: "I propose to form shallow, still water harbors or docks within the ship, entered by gates in the sides, and to carry, always afloat there, the loaded barges and tugs; turning the barges out and taking in fresh ones already loaded at the ports of discharge and shipment. Such a ship would require to be fortified and garrisoned like a town. She could be made absolutely secure against fatal injury arising from perforation. The subdivisions required for this purpose might be made to serve effectually against the spread of any local fire. I do firmly believe that we shall get the mastery over the seas, and shall live far more happily in a marine residence capable of steaming 15 knots an hour than we can ever live in seaside towns. The question whether we shall effect our conquest by mere size, or by mechanical devices, in ships of more modern proportions, depends upon the success of certain efforts which are now in progress in another direction."

F. M. Barber of the United States Navy is reported as commenting on this proposition as follows: This is to me a very curious and interesting discussion because it is all feasible; every bit of it feasible; only I think that if the Great Eastern with 24,000 tons displacement was no good, this vessel, with over 100,000 tons displacement, would be equally no good if she did not have speed.

The Present and Possible Speed of Ocean Steamships.

Undoubtedly, says the *Steamship* (John Lockie, Leith, Scotland), we are rapidly approaching limit of the speed for ocean-going steamers built with the materials which are available at the present time. Assuming the average Atlantic passage of the crack steamers to be six days, it will be interesting to consider what would be required to reduce the passage to five days. The present steamers crossing the Atlantic in six days have a mean speed of 20 knots per hour, with a displacement of 10,000 tons and nearly 20,000-horse power. To accomplish the voyage in five days, the speed would have to be 24 knots per hour, or an increase of 20 per cent. Applying Froude's law, we find that the steamer to accomplish the Atlantic passage in five days would require to have a displacement of 30 000 tons and have engines working up to 65,000 indicated horse-power, which would exceed the Great Eastern's dimensions. The strongest available material that we have for shipbuilding and marine engineering at the present time is steel, and with it a limit is soon reached at which the structure will fall to pieces with its own weight alone.

We have had several striking illustrations of this recently in the case of heavy artillery, which show with guns at least the limit of size and strength has almost, if not quite, been reached. The nearer the limit is approached, the greater will be the liability to failure, and consequently the greater the necessity for careful and scientific knowledge being brought to bear on the proportions and design. The only hope of a great stride being made in the increase of speed lies in the adoption of some lighter and stronger material, and so far as we know at present, there is only one metal possible, and that is aluminum. It is quite within the range of probability that at some future time a cheap process of manufacture may bring into practical use this abundant metal.

A FIVE-MASTED SHIP.—The new steel ship France, built at Partrick, Scotland, and the only five-masted ship ever built in the world with the exception of the Great Eastern, was launched a few days ago for French owners. She registered 3750 net tons, and is intended for the nitrate trade on the west coast of South America.

THE FASTEST SEA BOATS NOW AFLOAT.—The French sea-going torpedo boat Coureur is credited in *Lloyd's Register* with a maximum speed of 26.2 knots an hour. The torpedo boat Adler, constructed in Germany for the Russian Black sea fleet, is described by the Russian papers as the fastest war vessel afloat, having attained during its trial trip a speed of 26 55 knots. Three gunboats, one of which is finished, are being constructed in German shipyards for the Baltic fleet, which will be almost as fast as the Adler.

GOOD HEALTH.

WASHING OUT THE STOMACH.—During the past year, says an exchange, several physicians in New York have tried, with gratifying success, a novel treatment for dyspepsia and cancer of the stomach by washing out that organ. The process is very simple and not dangerous. A long flexible pipe is passed down the throat until one end is in the stomach. The upper end has a funnel attached, into which hot water is poured until the stomach is filled. The weight of the water in the pipe and funnel gives a hydraulic pressure sufficient to distend the stomach. The pipe has an aperture big enough to hold a lead pencil. After the stomach has been filled, the funnel end of the pipe is turned down until it is lower than the bottom of the stomach, and the stomach is emptied as a barrel of any fluid is emptied through a siphon. The process may be repeated several times. The result is that the undigested food and mucus are washed out, and the hot water closes the blood-vessels and reduces inflammation. The relief is immediate. The dyspeptic may have his stomach washed out before a meal, so that he can take a fresh start. After the lapse of a sufficient time for ordinary digestion, the stomach may be washed out again. This process has been in use at the New York hospital for some time. The stomach pump has been mainly used in cases of poisoning, and is considered to be the first essential before administering antidotes, but they are so seldom used that few physicians have them. Recently, in a case of poisoning, three prominent physicians were applied to for the use of a stomach pump, and neither of them had one, and the patient had to be taken to the hospital.

WATER AND SALT.—Salt is an absolute essential to the diet of man, says a physician in the Boston *Herald*. It promotes health in various ways. Many of the functions of the body go on better under its influence, and without it the blood becomes impoverished. While a complete privation of salt would produce disastrous results, an excessive use of it would be scarcely less harmful. In large doses it acts as an emetic; in quantities beyond the requirements of health it irritates and sometimes purges. Those who use salt unusually free almost always suffer more or less from constipation. To drink large quantities of water daily should be the rule with those who suffer from constipation. Every day the system needs at least two quarts water, as about that quantity is used up or thrown out of it every 24 hours. Fruits and vegetable food contain much water, and in tea, coffee, soups, etc., considerable is taken habitually. In all ways as stated, about two quarts of water should enter the stomach daily. It is a good plan to drink one or two glasses of water from half an hour to an hour before eating breakfast; and it may be either hot or cold, as preferred. Whichever is used, the water should be slowly sipped. To delude the stomach with cold water would be to invite dyspeptic troubles.

TO AVOID DIPHTHERIA.—A correspondent writes from Cincinnati that diphtheria may be prevented in the following manner: "On a greater or less sensation of pain in the throat, which often occurs from severe or even slight colds after the individual has been exposed to drafts from open doors or windows, take a small quantity of clean cotton and pack it well into the ears, so as to prevent the passage of air to the glands. It will instantly give relief, and nature will do the rest. By putting your fingers in your ears for a moment you may readily convince yourself of what the cotton will do if kept in place for any considerable time."

PRECAUTIONS AGAINST CONSUMPTION.—In a circular on precautions against consumption, published by the State Board of Health of Pennsylvania, the following advice is given: "The duster, and especially that potent distributer of germs, the feather duster, should never be used in a room habitually occupied by a consumptive. The floor, woodwork, and furniture should be wiped with a damp cloth. The patient's clothing should be kept by itself, and thoroughly boiled when washed. It need hardly be said that the room should be ventilated as thoroughly as is consistent with the maintenance of a proper temperature."

HYDROPHOBIA TREATMENT IN NEW YORK.—Since the New York Pasteur Institute opened in February last, 660 persons bitten by dogs or cats have applied for treatment. In 480 cases it was demonstrated that the animals were not mad, and in 130 cases anti-hydrophobic treatment was applied, and all these patients are now in good health. Twenty-one States are represented by patients, one coming from Arizona.

PASTEUR IN RUSSIA.—The Russian Government has made an appropriation of 1500 roubles annually for the maintenance of a Pasteur Institute in Tiflis for the cure of hydrophobia.

USEFUL INFORMATION.

CAN WE MANUFACTURE FINE LINEN GOODS? It is said the effort to manufacture linen from home-raised flax in Minnesota is taking form, work having been begun on the factory at Minneapolis. This experiment will be watched with a good deal of interest, as it is proposed to make a textile product of much finer quality than this country has yet produced. The company has a capital of $500,000. The manager has gone to Ireland to procure the requisite machinery and experienced workmen. The success of the enterprise is devoutly to be wished as the solution of an important problem. Another large mill is proposed by the Eau Claire Linen Company, and several large scutching mills, to prepare the raw material, have been started on the American side of the Canadian border line. Other similar projects are spoken of.

A SUBSTITUTE FOR TOBACCO.—Many different vegetable substances used as stimulating beverages in widely distant parts of the world have been shown to contain caffeine as their active principle. Only one substitute for tobacco has, however, as yet been discovered. This is the leaves of the *Dubosia hopwoodii*, a shrub growing in Australia, the leaves of which are chewed by the blacks in the same way and for the same purpose as tobacco is chewed. The leaves contain an alkaloid, piturine, which is said by certain chemists to be identical with nicotine, but more probably is only closely allied to it. Messrs. Langley and Dickinson have recently shown that the actions of nicotine and piturine are in every respect identical. —*British Medical Journal*

THE BOSTON FRANKLIN FUND IN DANGER.—In his will, Benjamin Franklin bequeathed $4000 to the cities of Boston and Philadelphia, to be loaned at 5 per cent to young mechanics. At the end of 100 years the cities were to divide the amount, which was figured to be $665,000 for each trust fund. The 100 years have expired, and Franklin's heirs have commenced suit to recover the money, alleging mismanagement on the part of the cities, Boston's fund having reached only $400,000 and Philadelphia's fund only $100,000.

SALT AS A PRESERVATIVE.—A correspondent of the *Scientific American* writes to that journal as follows: "Thirty-four years since, I set four 4½ by 4½ inch oak hitching-posts near my residence, 3½ feet deep in the earth, having first bored one 1-inch hole into same some 3 inches above, and another hole of like size some 4 inches below the earth's surface, and partly filling each hole with salt, and then plugging same with a dry oak plug. The posts are today sound and strong. Draw your own inference."

A HUGE BLAST.—No less than 22,000 pounds of powder were used in a successful blast recently at Port Crescent, on Puget Sound, in the State of Washington, for the purpose of displacing about 65,000 tons of rock, or 320,000 cubic yards of rock in a bluff that juts out at the western side of the harbor at that place. It was fired by electricity and the result was entirely satisfactory.

WOODEN FLOUR.—Wooden pulp, which is prepared to be mixed with rags in the manufacture of white paper, is said to be largely used in the manufacture of flour which is ordered by contractors for furnishing Indian rations, and not a little of the same material is said to enter into the cheap bread sold to the poor in the Italian and Hebrew districts of New York.

A LARGE OSTRICH FARM.—In Northern South Australia, ostrich farming is now firmly established. Malcolm's Ostrich Co. has a thriving farm near Port Augusta, with some 7000 acres of rather dry country, the flock numbering 715, the increase being 200 during the last year, and returning over $5500 for feathers.

ALL THE SAME EITHER WAY.—The Bath, Maine, *Times* says that Dr. John C. Berry, who is in Asia on a vacation, mailed a letter and a postal-card to Dr. R. D. Bibber of Bath on the same day, sending one westward via St. Petersburg, and the other east via San Francisco. The letter and card reached Bath in the same mail.

MICROSCOPICAL SCREWS.—It is stated that a lady's thimble of the ordinary size, No. 7, will hold 1,000,000 of the smaller little brass screws used in the manufacture of fine small watches. These screws are so small that to the naked eye they look like specks of brass, and it requires a magnifying glass to show their real character.

TO GET RID OF THE SPARROWS.—It is stated that cornmeal mixed with strong brine or moistened with salt, dried, exposed in the ravenous appetite of the sparrows, is as sure as electricity, therefore not a cruelty to animals.

AN "INCH OF RAIN" means a gallon of water spread over a surface of nearly two square feet, or a fall of about 200 tons to an acre of ground.

DARWIN defines the wag of a dog's tail as "an escape of nervous force restrained for the moment from other modes of expression."

AN ALLOY OF ALUMINUM AND TIN.—According to the *Bulletin International de l'Electricite*, M. Bourbouze is manufacturing an alloy consisting of 100 parts of aluminum and 10 parts of tin, which is said to possess all or most of the advantages of pure aluminum.

ELECTRICITY.

ACCIDENTS FROM ELECTRIC WIRES.—It is quite noticeable that although the business of electric lighting and the use of wires for conducting power is growing rapidly in every direction, accidents of all kinds are much more infrequent. The dangers of electricity have been altogether overrated. There is really no more danger from that source than from gas, when people become educated as to the nature and liability of danger, and learn to act with caution. The more proper placing and insulation of wires has also, no doubt, much to do with the growing immunity from danger. Captain Brophy, inspector of the Electrical Insurance Company of Boston, recently read a paper in reference to this matter in which he said: "The electric light, the electric motor and the electric car have come to stay. Like all other great inventions, they have their faults and they are not free from danger. What form of energy is? Like the steam railroad, the steamboat, illuminating gas and many other great improvements, they have met with stubborn resistance; but in time this will all cease. When railroad trains leave the rails and crush the human form into a shapeless mass, the public do not ask for the abolition of such roads. When swinging gas-jets start a conflagration, or when some unsophisticated person blows out the gas and lies down and passes into eternity, no one demands the abolition of gas works. Why, then, should an unreasonable outcry be raised against the electric light and power industry when this subtile fluid leaves the path chosen for it and causes accidents to persons and property? From my own observations and an intimate knowledge of the difficulties that it was necessary to overcome, I am astonished at the small number of accidents that have occurred since the introduction of high potential currents."

A NEW ELECTRIC CAR STARTER.—One of the greatest difficulties which has assailed the electrical engineer in designing apparatus for electric street-car service is the requirement of an excessive amount of power to start the car from rest. Almost all the cars in service to-day are fitted with evidently far too much power to keep a car in motion at any speed up to 12 or 15 miles an hour. This extra power is necessary solely to start the car from rest, and any device which will obviate this difficulty is worthy of serious consideration, and will be welcomed by all the street railway men. Mr. John H. Palmer has recently brought to Boston a working model of a device which bids fair to prove an unqualified success, and whose principle consists in having a variable leverage mechanism, obtained by involute wheels, by which an enormously increased leverage is attained on the driving-wheels at the moment of starting the car, and for some time after. After getting the car fairly set in motion this mechanism is automatically cut out, and the motor continues to drive the car in the ordinary manner, another clutch automatically gearing into the driving shaft an instant before the starting mechanism is cut out. The model works most accurately and exhibits some very pretty mechanical devices. Experts who have seen it are agreed that the whole device has been most carefully worked out, and will undoubtedly do all that is claimed for it when put in actual operation. The motor can either be kept running all the time or stopped with every stop of the car, if as desired.—*Electrical Engineer.*

ELECTRICITY IN MEDICAL PRACTICE.—A number of Philadelphia physicians and surgeons have formed themselves into an organization called the Electro-Therapeutic Society. The object of the society is to discuss the question of electricity combined with medicine and surgery. Heretofore the subject has been empirical, and it is proposed to take it out of the hands of the irregulars, so that the regularly certified practitioners can make it popular from a scientific standpoint. One of the Philadelphia physicians has taken a very wise step in the introduction of a small electric machine for the production of ozone. It is in a very compact form, operated by a small battery, and can be conveniently carried. There is said to be a large demand for the machine for purifying the sick-rooms of private patients. An electrician the other day said: "A simple and almost perfect method for purifying the atmosphere of crowded apartments, such, for instance, as railway cars, is to produce ozone by electrical sparks, and the practice has been strongly recommended by the highest medical authorities. The delightful freshness and vigor which is perceptible in the air after a series of sparks from an ordinary influence machine, is a proof of the salutary and refreshing influence produced."

ELECTRICITY FROM HEAT.—The effort to obtain electricity direct from heat, without the intervention of boilers, engines and dynamos, goes on, but without satisfactory commercial results as yet. Edison and Berlinger did something several years ago, but their efforts were not pushed. A Pittsburg inventor claims to have accomplished more. We hear nothing more about "the young man from Maine," or the Hartford company which was to demonstrate his invention.

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Passing Events.

With some signs of an approaching change, the heavens continue to maintain the brazen aspect worn through all the summer and far into the fall months. Throughout all California there would be welcomed now a soaking rain.

The early part of the week was signalized by such a tumble in prices in the Eastern stock market as came well-nigh precipitating a panic, nor is the danger of such result fully over.

A queer notion has gotten into the heads of the Indians throughout nearly all parts of the interior, these poor people being excited over the expected coming of a Messiah, who it is believed will destroy the whites and restore the aborigines to their ancient possessions.

There is being developed in Belgium a strong sentiment in favor of substituting a republican in place of a monarchical form of government.

The great labor strikes long pending in England and Australia seem to be everywhere on the wane, sometimes through concessions made by the contending parties, oftener through the sheer exhaustion of the strikers.

The project of a railroad to be extended the whole length of Central and South America appears to be meeting with favor in strong financial quarters.

While the Nicaragua canal is making satisfactory headway, the affairs of the De Lesseps ditch seem to be going from bad to worse.

In their mutual recriminations, Stanley and his aids are charging each other with murder, cannibalism, poisoning, and a variety of other barbaric pastimes to the general disgust of the public, while a sensible impartiality credits in part the stories of both.

The sound and fury of the late election has so far subsided that there is heard now only the complaints of the defeated and disgruntled office-seeker and his friends. The results stand something like the popular beverage of the Britisher, "'alf and 'alf."

The town of Truckee, Nevada county, nearly half of which was destroyed by fire on the morning of the 8th inst., is being rapidly rebuilt.

The tower of Babel is to be reproduced at the World's Fair; of course, on a small scale, and this time from stone, brick and iron instead of adobe, as before.

Improving the Great Occasion.

If the mineral resources and products of California are to be adequately represented at the Chicago World's Fair, it is time we were beginning to move in the matter. Already, States comparatively poor in this respect have taken preliminary steps looking to such end, thereby setting an example that might here well be emulated. It should not be forgotten that California outranks all other countries as regards the varied forms of her mineral wealth, nor yet, that she remains still the largest producer of gold in the world. There can be collected in this State a greater variety of the useful metals and minerals than in any other State or Territory in the Union. We have here every valuable product that occurs in the mineral kingdom, with some rarely found elsewhere, though of the first economic importance. We could, with little exertion and at small expense, make such a display in this department as would not only overshadow all competitors but greatly advance our material interests and glorify the State, and we must see to it that this is done.

But it will not be done unless the people addressing themselves to the task take care that the Legislature, at its next session, provide funds for the purpose. Enough money must be appropriated by that body to defray the cost of collecting, preparing and forwarding to Chicago specimens of every valuable metal and mineral found in the State, including expenses of suitable persons to see that these specimens are properly displayed and to care for them during the Exposition and after it is over.

Not soon will California have another such a grand opportunity to advertise her mineral resources, wherefore she should now strive to make the most of it. And in availing herself of this opportunity, she must not, as on former occasions of this kind, be forced to have recourse to begging subscriptions or to borrowing from private individuals, in order to make a presentable appearance at one of these national shows. Not again must we be subjected to the humiliating spectacle of passing around the hat as a means of raising funds for effecting an object of such general utility. It will become the duty of the Legislature to save us from a repetition of such indignity, nor is it likely that the enactment of a law looking to such end would invoke serious opposition.

As an encouragement for us to act promptly and vigorously in this matter, it may be stated that at a late meeting of the World's Fair directors, the big underground mining exhibit, suggested by Col. Browne of Colorado, was determined upon, this proposition having before been indorsed by the National Commission. In carrying out the plan suggested, it is proposed to have constructed a palace 500 feet below the surface of the ground, traversing which there will be drifts filled with ore in such manner as to represent the underground workings of the leading mines of the country. The site of this exhibit will be on the lake front, the work being performed by a separate corporation, composed chiefly of mining men. This, of course, is aside from the mineral specimens on view in another part of the exposition, but it illustrates the importance attached by the managers to everything pertaining not only to the mineral wealth of the country but also to the department of actual mining.

Presuming that our people will determine in favor of having our mines and minerals duly represented at the coming World's Fair, the question arises as to the best means available for effecting this purpose. But we need not look far for this; undoubtedly the State Mining Bureau now, as on previous occasions of this kind, presents the best medium for carrying out this object. Here we have an institution already organized and in good working order. It belongs to the State and is in charge of State officers. Its duties are kindred to those required to be performed, and it can, under that clause of the law which empowers the trustees, acting in conjunction with the State Mineralogist, to provide for a display of the Bureau's mineral cabinet at any World's Fair when they see fit, be employed in the manner above suggested.

The Board of Trustees of the Mining Bureau consists of men who, in a matter of this kind, can be fully trusted. Acting with the State Mineralogist, they would constitute a board eminently well qualified to determine what should be done in the premises; wherefore it would be the part of wisdom for the Legislature to take counsel of them.

In the first place, it might be found that many mineral specimens could be spared from the Bureau's collection without detriment to the institution. Where there are duplicate samples this could always be done. Then the Bureau, being so thoroughly organized and centrally located, could be made a nucleus for the ingathering of minerals from every quarter. Reaching this central depot, they could here be assorted, properly labeled and packed preparatory to shipment to their place of destination. That an appeal to collectors, miners, quarrymen and others engaged in similar pursuits, instructing them as to what sort of mineral specimens were most required and how to select them, would meet with a ready response from these parties, might be fully counted upon. Adopting this plan, a splendid mineral exhibit could, without much cost and to the great benefit of all concerned, be made certain. In drawing on the Bureau it would not do to so deplete its mineral cabinet that visitors would have just cause to complain of its impoverishment. Nor would this be necessary in a country so rich in this species of natural wealth and in which mineral collections do so abound.

In making choice of an agent to look after this collection at Chicago, care should be taken to select a thoroughly competent party, to the end that the mistake of subordinating the State Mineralogist to a person devoid of the first qualification for the place, as was done in the case of the New Orleans Exposition, be avoided.

Contributors should bear in mind that all samples sent to the fair will remain subject to their control; that is, they will when the exhibition is over be returned to the owners or be otherwise disposed of as they may direct. If returned, they will be so carefully packed as not to be damaged by handling or transportation.

Mr. Irelan, the State Mineralogist, holds himself in readiness to co-operate with the trustees of the Mining Bureau and other public authorities to the fullest extent possible. The resources and entire machinery of the Bureau, as well as his own services, will be placed at their disposal, so far as he has legal warrant for doing so.

A NEW YORK DISPATCH of recent date says: The Mississippi river commission finished its labors Saturday night after appropriating over $3,000,000 for improvements on the lower Mississippi and its tributaries. The original amount appropriated for the work was $3,200,000, and it is nearly all used up as follows: For dredging the Mississippi river from Cairo to White river, including Pin Point reach, $500,000; for the same kind of work from White river to Warrenton, including Lake Providence reach, $720,000. For the building of levees these amounts were appropriated: Yazoo front for levee, $300,000; Tensas front for levee, $500,000; White river front for levee, $200,000; below Red river for levee, $200,000; Greenville harbor, $100,000; for Vicksburg harbor, $75,000; for New Orleans harbor, $100,000; Red and Atchafalaya rivers, $250,000; survey and expenses, $225,000; total, $3,170,000. The commission will report to the Secretary of War, and as soon as he approves the apportionment the work will be begun.

The Future of Mining.

In speaking of the business of mining on this coast, we know what is past but can only guess as to what lies before us. But with all we have accomplished, and it amounts to a good deal, we are yet only learners. Much of what has been done, both as regards money expended and labor performed, has been preliminary and experimental. As we have been learners, so are we learners still and such we will remain for a long time to come. We were at the outset profoundly ignorant of this business. We had to learn its very alphabet. We were without knowledge, technical or practical. Our teachers, brought mostly from abroad where they had worked under circumstances widely different from those that here prevailed, in attempting to adapt themselves to their new conditions, blundered badly. Our leaders misled us; our trusted men were at fault. If, then, much that has been done has been done badly, little wonder. If disappointments have come and losses been sustained, we should be judged lightly.

But this is of the past—what of the present and what of the future? Just this: We are now doing our work tolerably well, but will do it much better hereafter. Gold-mining is today as safe and as remunerative a business as any other pursuit in California. There has not occurred here one signal failure in this business of late, and if there have happened some of minor importance these will be fewer hereafter; and it is with us a good time now to engage in this industry—a better time, perhaps, than it will be later on.

Our claim-owners, impoverished and weary with long holding on, are willing, and even anxious, to part with their properties on reasonable terms. Undeveloped and partially developed mines can be bought cheaply—very often at prices far below their intrinsic values. It may not, and probably will not, always be thus. By and by mines will be bought not only to be worked but to be held for a rise in the market. When that time shall come these properties will appreciate, for there will be competitive buyers.

The most of us will live to see the gold mines of this State classed among favorite investments. With some far-seeing capitalists they are so regarded at present. The day of the adventurer and the wildcat is over. The era of disappointment and loss has about ended. Disaster is about to give way to success, and timidity to a well-founded confidence. All hail the day these transformations shall be fully effected.

ADVICES from Colorado convey the information that a miners' home is soon to be established at Denver by private contributions. It is to be open to indigent and homeless miners. It is not to be considered a charitable institution, but one upon which the miner, by nature of his occupation, has a claim. In few occupations are the perils so great as with the miner. He is constantly in danger of losing life, limb or health while working for his daily bread. These homes, of which there are several in different parts of the country, serve to mitigate the miseries attendant upon indigent old age. From a humanitarian standpoint it should receive hearty encouragement. The administration of this home has been placed in the hands of an excellent managerial board, which fact, together with the worthy purpose which it is calculated to subserve, goes far toward insuring its success.

IN consequence of the colliers' strike, the ironworkers at Melbourne are exhausting their supplies of coal. Many hands have already been dismissed, and a general stoppage of the works is threatened.

THE German builds his railroad cars for men. He puts his cigar-holders and match-receivers into 19 compartments out of 20, the twentieth being nominally, not often actually, reserved for "non-smokers."

A SCHEME is under consideration for the construction of a railway up the Jungfrau in Switzerland, one of the loftiest of all the Alpine peaks.

IT is thought that the Ericsson submarine guns can be converted into smooth bores, thereby saving the Government much expense.

THE Americans can now successfully compete with foreign nations in the making of first-grade steel.

The African Explorers Ventilate Their Exploits.

There seems now a danger that in the Kilkenny cat fight being waged between Henry M. Stanley and his lieutenants both parties will come out badly damaged, as each appears able to tell some very hurtful stories of the other. So long as left to toot his own horn it was an easy matter for Stanley to make himself out a hero, but with these counter-blasts these heroic proportions threaten to shrink into the dimensions of a pigmy.

Just now Henry M. is entertaining the New Yorkers with an account of his exploits, which they appear to enjoy with a hearty relish, as why should they not? A people who are ready to accept the caricatures of Harte and Clemens as veritable facts ought to be able to swallow the Munchausenism of Stanley without undue strain of the gullet.

We venture the assertion that there can be found a thousand prospectors on the coast who, in the prosecution of their calling, have undergone more hardships and braved more dangers than ever did this much-vaunted African explorer. And yet these men would blush were they made the recipients of the fulsome praise with which this pet of the drawing-rooms has been heslobbered, both in this country and England.

A BETHLEHEM, Pa., dispatch, dated October 27th, says: A monster casting, the largest ever undertaken at the immense plant of the Bethlehem Iron Company, was successfully made to-day. All the cupolas, six in number, in the Bessemer department, besides number one and two furnaces, were used for this casting. One hundred and twenty-five tons of metal were melted, then poured into ladles placed on trucks, which were transferred over the narrow-gauge railroad by means of small locomotives to the mold in the open-hearth department connected with the ordnance plant.

Prescott, Arizona.

(Concluded from page 314.)

nerated there will be great expansion of work in this camp, and even additional labor will be needed.

Our correspondent's next visit was to the Senator mine, 12 miles east of Prescott. The increasing importance of this mine has encouraged an experienced stage man to put on a daily conveyance, and the Senator can now be reached with ease. This property is one of a number of mines owned in Arizona by Phelps, Dodge & Co. of New York, the well-known metal-broker firm. One of the company's great mines is at Bisbee, Cochise county; another is the Old Dominion mine, in Gila county, while in the vicinity of Prescott the Senator, the Boggs, the Hackberry and the Copper Basin are all under the same management. One of the company's great mines is at Bisbee, Cochise county; another is the Old Dominion mine, in Gila county, while in the vicinity of Prescott the Senator, the Boggs, the Hackberry and the Copper Basin are all under the same management. The company will be erected an extensive smelter to treat the ores from their various properties as well as the ores from Big Bug and other districts. They already have one smelter in Copper Basin. The same company is also said to be seriously contemplating the building of another narrow-gauge railroad from Prescott through Groom, Hassayampa, Turkey Creek and other mining districts to the mines of Bradshaw district.

While in Prescott, our correspondent learned that the Ryland mine, 45 miles south, was soon to be put under new management. The prospects are that its extensive plant, including a 20-stamp mill, will be utilized to good advantage, and the property will be made to show up to much better advantage than it has in the past.

All indications seem to point to the fact that a new era in mining has dawned for Prescott. Men of capital are pushing work on their properties, and this gives confidence to smaller operators, of whom there are a legion. There is a buoyant and hopeful feeling which will tend to carry many enterprises to a successful issue.

Among the gentlemen whom it was the pleasure of our correspondent to meet while in Prescott, the following, in addition to those named in the previous part of our letter, are more or less interested in the mining industry: Ex-Gov. Tritle, one of the most public-spirited citizens of Arizona; Basford & Burmister, the leading merchants of the city, who own scattered mining properties in different states of development all over the tributary region; E. M. Sanford, a leading attorney, but a gentleman who devotes considerable attention to mining matters; the president and other officers connected with the Bank of Arizona, one of the wealthiest banking corporations in the Territory; Julius Baumann, mining expert, civil engineer, etc., a gentleman well versed in all mining matters of Northern Arizona; W. H. Hatcher, superintendent, and John Front, foreman, of the Senator mine; R. H. Hetherington, assayer, well qualified for his work by many years' practical experience; J. W. M. Moore, of the Arizona Real Estate, Loan and Investment Association; W. M. Claypool, of the Prescott Ore Works, who has a fine sampling plant where he treats ores that are shipped in from a radius of 100 miles; J. Dudley Helm, of the Tiger mine and other properties; Clark & Adams, proprietors of Prescott lumber-mills, who have varied mining interests, among which is a five stamp mill; C. R. Martindell, the leading insurance agent of Prescott, who also lends encouragement to mining matters; J. W. McGowan, proprietor of the Williams hotel, but former owner of the Senator and Congress mines, besides other properties; Dan'l O'Boyle, now devoting attention to hydraulic mines; Dan'l Hatz, B. F. Rigg, G. W. Sines, F. E. Doggett, all of whom have more or less extensive interests in mining claims; Frank Carlisle of the Black Horse mine; J. F. Mahoney, engineer of City Water Works; A. G. Oliver, post trader at Whipple barracks; Freeze & Belcher, H. Olmsted, G. Schuerman, Jas. Shirley, Will Dulin, Jno. Bryant, W. W. Vanderbilt, M. Blauvett, Wallace & Burnett, J. P. Humphrey, M. Maier, Chas. Rice, B. C. Thorne, C. T. Kelly and J. R. Masterson. The above list includes a goodly proportion of the business men of Prescott, which indicates the extent to which the great industry of mining is absorbing the attention of her enterprising people.

H. G. P.

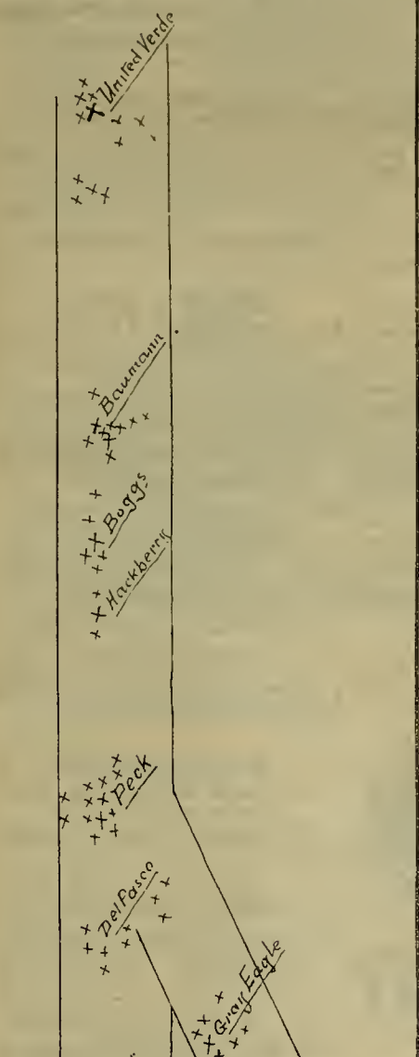
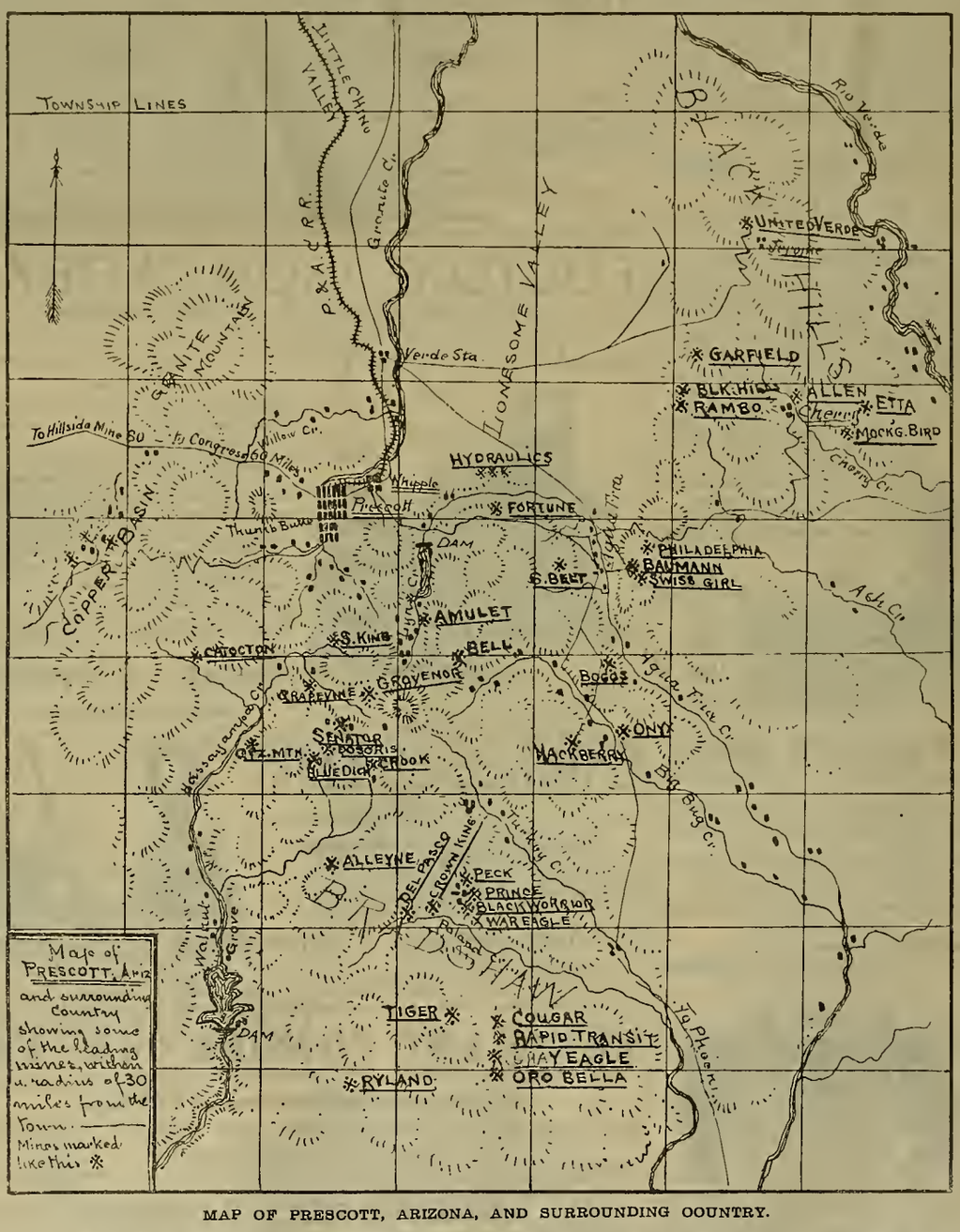


DIAGRAM OF THE GRAY EAGLE AND OTHER MINING LOCATIONS.



MAP OF PRESCOTT, ARIZONA, AND SURROUNDING COUNTRY.

PASSENGER CARS OF AMERICAN PATTERN are to be put on all German Government railways much used by tourists, says a dispatch from Berlin. The change is to be commenced next summer.

THANKSGIVING.—The President and the Governor have issued the usual proclamations appointing Thursday, November 27th, as the National Thanksgiving. Let all prepare for it,

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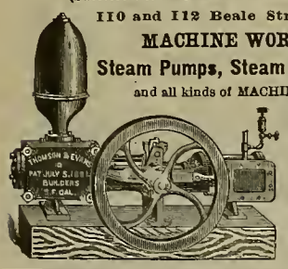

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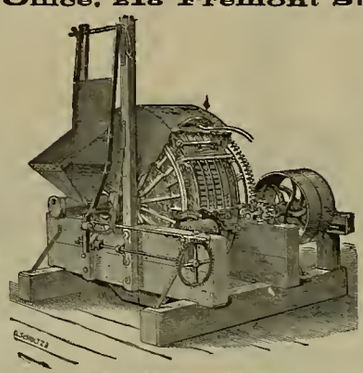

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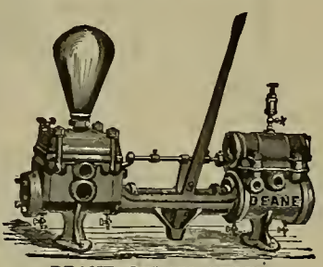

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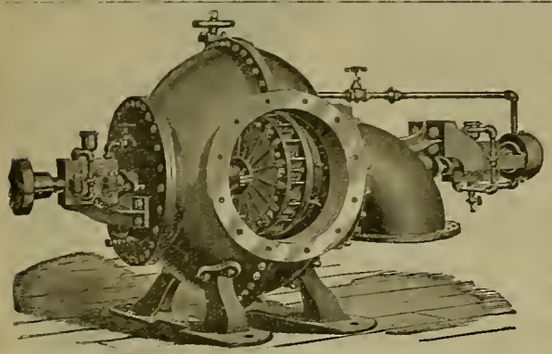

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Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

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ANNUAL CAPACITY 800. ESTABLISHED 1831.

LOCOMOTIVE ENGINES!

Adapted to every variety of service, and built accurately in standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Broad and Narrow Gauge Locomotives, Mine Locomotives by Steam or Compressed Air, Plantation Locomotives, Noiseless Motors for Street Railways, Furnace Locomotives, etc.

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Is known to be the Best Horse-Power Hoist now made. It is strong and durable.

The drum will carry 1100 feet of five-eighths steel rope. It can be used to run a pump or blower, in conjunction with hoisting. Manufactured by

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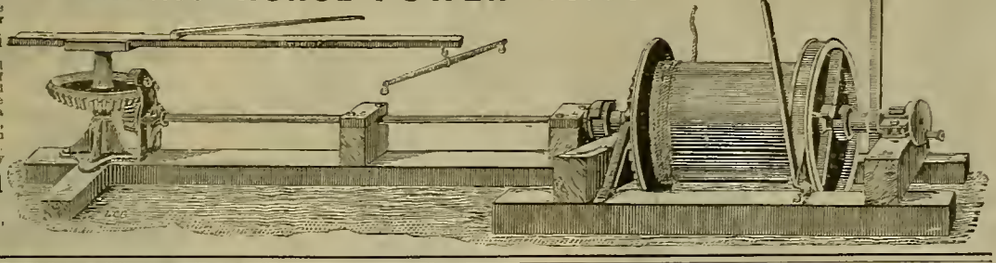

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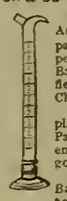

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 13, 1890.

No sooner did the election excitement subside than a money panic at the East and in England set in to disorganize trade. At the close, New York and London telegrams report an easier money market and the panic over. Considerable money is said to have been sent from here to New York so as to take advantage of the high rates of interest ruling in that city. Our money market is fairly easy. Considerable money is being paid for city taxes in various parts of the State. Next month State taxes are due, when large sums will be paid. This money will begin to go into circulation after the turn of the year.

MEXICAN DOLLARS—There was a fair demand the past week for China at 82½@83½ cts.

SILVER—Considering the close money markets abroad and at the East, silver stood up well, but this was largely due to Government purchases, which with the month not half gone, were nearly 3,000,000 ounces. The following telegrams give particulars of the purchases:

WASHINGTON, Nov. 7.—The amount of silver offered for sale to the Treasurer to-day was 1,045,000 ounces. The purchases aggregated 420,000 ounces, as follows: Fifty thousand at $1.022, 60,000 at $1.035, 100,000 at $1.0245, 130,000 at $1.025, and 30,000 at $1.026.

NEW YORK, Nov. 7.—Dow, Jones & Co.'s News Agency publishes a letter from a London banker on the recent fall in silver. He says: "The market bas deprived us of support from India, there being no disposition to ship to the East, where money rules at an abnormally low rate. The chief cause of the decline is the high rate for money on both sides of the Atlantic. There is no feature in Mexican dollars."

WASHINGTON, Nov. 10.—Six hundred thousand ounces of silver were offered and purchased at the Treasury to-day as follows: One hundred thousand ounces at $1.0299, 50,000 at $1.031, 100,000 at $1.032, 50,000 at $1.033, 100,000 at $1.0345, 100,000 at $1.036, 50,000 at $1.037, 50,000 at $1.0373. The amount of silver purchased at the Mints during the week ended November 8th was 275,889 ounces. The total amount purchased for this month, including purchases at the Mints and to-day's purchase at the Treasury, is 2,180,333 ounces.

WASHINGTON, Nov. 12.—The amount of silver offered to the Treasury to-day was 862,000 ounces. The purchases were 737,000 at $1.032@1.0395.

QUICKSILVER—Receipts the past week aggregate 378 flasks. The market has held to steady prices.

BORAX—Receipts the past week aggregate 224 ctls. The market is quiet but firm.

ANTIMONY—The market is a shade easier in sympathy with lower prices at the East.

LIME—Receipts the past week aggregate 5025 bbls. and exports 700 bbls. to Honolulu and 300 bbls. to Kahului. The market is steady with a good demand reported.

IRON—English advices report a strong market under a growing scarcity of "makers' iron." At the East the market is quiet. Our market is steady.

TIN—The market for hoth plate and pig is reported dull but steady. Large quantities of plate will be due to arrive here before the increased tariff on the same takes effect. A London cable to *Iron Age*, Nov. 6, says: The market for tin plate has been firm, but quiet, buyers being still inactive, while makers bold for full prices. There are, however, negotiations pending on large quantities for delivery during the early part of next year, including some interest on the part of American buyers.

COPPER—The markets of the world appear quiet but steady. Stocks are being steadily reduced, which after the turn of the year ought to have a favorable influence on the market.

COAL—Imports the past week aggregate as follows: Nanaimo, 4308 tons; Coos Bay, 500; Departure Bay, 2253; Comox, 2350; Seattle, 7250; Tacoma, 5900; Newcastle (England), 1731; Hull, 247. Total, 24,539 tons. There were exported the past week 350 tons to Kahului. The market has not appreciated as dealers expected, continued mild weather being against holders. Receipts of coast coals are increasing. Australian for January shipment is offering, which indicates that the strike is off. With free shipments from there, prices cannot hold up after this year, particularly with coast coal coming in freely.

Eastern Metal Markets.

By Telegraph.

NEW YORK, November 13.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	.48	1 04½	$16 75	$5 87½	$21 20
Friday	.47	1 02	16 75	6 25	21 00
Saturday	.47½	1 02⅜	16 75	6 35	20 95
Monday	.47½	1 02½	16 75	5 20	20 90
Tuesday	.47½	1 02½	16 75	6 20	20 90
Wednesday	.47⅜	1 02½	16 75	5 20	20 90

NEW YORK, November 11. — Copper—Quotations unchanged; all grades in the London market declined to £56 12s spot, £56 15s future. Pig lead is ecilinc in small quantities, $5.25 prompt, $6 15@6.20 for near future. Those prices apply to domestic and foreign deliveries on old purchases to keep the consumer supplied. There is comparatively little accumulation. The prices would be stronger if the European supplies should fall off.

Coal.

SPOT FROM YARD—PER TON.		TO LOAD—PER TON.	
Wellington, nominal	$12 00	Australian	$ 9 00@— —
Oreta	14 00	Liverpool Steam	8 60@— —
Carbon Hill	9 00	Scotch Splint	8 60@ 9 00
Nanaimo	11 00	Cardiff	8 60@— —
Gilman	11 00	Lehigh Lump	16 60@17 00
Seattle	11 00	Cumberland lik	13 50@— —
Coos Bay	11 00	Egg, hard	16 00@— —
Cannel	16 00		
Egg, hard	16 00	**Coke—English.**	
Cumberland, in sacke	19 60		
do. bulk	18 00	To load	$12 00@13 00
Wallsend	13 00@14 00	Spot, in bulk	16 00@18 00

All spot quotations subject to change without notice.

Mining Share Market.

In last week's issue we stated that well-informed operators looked for a sharp setback before higher prices prevailed. The decline has come, although there are those who claim that prices must go still lower before there are much higher figures. This opinion is said to be based on information obtained from the mill pool or ring. The latter are trying to get the market very low so as to break the outsiders who are fighting for honest mine management, and at the same time make the reform movement odious. Stock dealers must not forget that to save a life amputation of a limb is often necessary. So it is in this case, to save the mining industry, dishonest mine management must be cut off, and the first step in this direction is to report all work done in the mine, ore struck, its width, assay, etc., car samples and battery assays, and everything else reported in detail for inspection of stockholders. The next is to get mine and mill officials whose word is as good as their bond. Moneyed men are slow in buying stocks unless prices get low and then sell at each small advance, for to buy at high prices past experience has demonstrated that it is tails outsiders lose and heads the mill ring wins. It has apparently come to such a pass that an ore development on the Comstock lode is looked upon as a disgrace. This can be qualified by saying it is a disgrace, provided outside dealers have the stock. At the decline this week, large lines of margined stock were uncovered —even cash stock was sold by outsiders. In outside stocks there was more activity in the Bodies at declining prices, and in the Tuscaroras at better prices, owing to Commonwealth declaring a 20-cent dividend. The Quijotoas were more or less neglected.

Another bullion shipment is expected from Bodie on next Monday. It will be the monthly cleanup. How much there will be is not reported. As the pool bought a good deal of Bodie stock at declining prices, the shipment may be quite large so as to make another peddle of this stock at a good round profit. Extensive and important prospecting work is being done in the mine.

The money panic in London and New York and a crash in railroad securities is said to have had an unfavorable influence on mining shares. Bankers called on brokers for money, and in turn brokers called on margin buyers for money; the latter failing to respond were closed out. Many on first demand for money sold out, others put up more money or stock, and in the end all or the major portion went. The short interest has filled at a good profit. The market opened this (Thursday) morning steadier, hut after Call the tone was heavy, owing to Potosi weakening. Well-informed parties look for Potosi and also Confidence to go lower, which they claim will send the entire list lower.

News from the mines continues scarce, which is an unmistakable evidence that insiders are buying stock. Whenever hig hull news from the mines gets out it has invariably been accepted as a sure indication that insiders are selling. Advices from Potosi report that another west crosscut has been started about 50 feet north of the first crosscut on the 1130 level. In the first crosscut ore was run into assaying $40 a ton which has a width of from 12 to 15 feet. In Hale and Norcross important work was started the past week, as there was in Crown Point. In the latter mine a southwest crosscut was started to tap the ore known to be on that level. The pumps to pump out the Gold Hill mines can be started up at any time the stock market in this city justifies. As for that, very rich ore can be shown up in one or more mines on the Comstock when the stock market is in good position for an up move, that is, outsiders have few stocks. It looks as if the latter are well cleaned out now, although another scare may he necessary to do the work.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, November 13, 1890.

ANTIMONY	—	@	21
BORAX—Refined, in carload lots	8	@	—
Powdered " " "	8	@	—
Concentrated " " "	7½	@	—
All grades jobbing at an advance.			
COPPER—			
Bolt	23	@	25
Sheathing	23	@	25
Ingot, jobbing	20	@	—
do, wholesale	18	@	18½
Fire Box Sheets	23	@	25
LEAD—Pig	6	@	6½
Bar	6¾	@	6¾
Sheet	7½	@	—
Pipe	7	@	—
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 90	@	—
Buck, ₱ bag	2 10	@	—
Chilled, do	2 30	@	—
QUICKSILVER—By the flask	54 00	@	—
Flasks, new	—	@	—
Flasks, old	45	@	55
CHROME IRON ORE, ₱ ton	10 00	@	—
STEEL—English, lb	16	@	20
Canton tool	9	@	9
Black Diamond tool	9	@	9
Pick and Hammer	8	@	10
Machinery	4	@	5
Toe Calk	4½	@	—
TINPLATE—B. V., steel grade, 14x20, to arrive.		@	—
B. V., steel grade, 14x20, spot	6 12½	@	6 25
Charcoal, 14x20	6 50	@	—
do roofing, 14x20	6 00	@	—
do, do, 20x28	13 00	@	—
Pig tin, spot, ₱ lb., nominal	23½	@	24
IRON—Bar, base	3	@	3½
Norway, base	4½	@	5½

	Spot.		To Load.
IRON—Glengarnock ton	34 00	@— —	30 @ —
Eglinton, ton	34 00	@— —	30 @ —
American Soft, No. 1, ton	— —	@32 00	33 @ —
Oregon Pig, ton	— —	@33 00	— @ —
Puget Sound	34 00	@— —	— @ —
Bar Iron (base price) ₱ lb	—	@— —	— @ —
Clay Lane White	— —	@28 00	26 @ —
Shotts, No. 1	34 00	@35 00	32½@ —
Langloan	34 00	@— —	30 @ —
Thorncliffe	34 00	@— —	30 @ —
Gartaherrie	34 00	@— —	30 @ —
Barrow	34 00	@— —	30 @ —
Thomas	33 00	@— —	— @ —
Cargofleet	30 00	@— —	26 @ —

Complimentary Samples.

Persone receiving this paper marked are requested to examine its contents, terms of enhscription, and give it their own patronage, and, as far ae practicahle, aid in circulating the journal, and making its valne more widely known to others, and extending its influence in the canse it faithfully serves. Snhscription rate, $3.00 a year. Extra copies mailed for 10 oents, if ordered soon enongh. If already a subsorihsr, please show the paper to others.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Baker Divide & M Co	California	18	20	Nov 17	Dec 8	D M Kent	330 Pine St
Challenge Con M Co	Nevada	7	50	Sept 26	Oct 28	Nov 17	O L McCoy 331 Pine St
Con Imperial M Co	Nevada	29	5	Oct 15	Nov 15	Dec 8	O L McCoy 331 Pine St
Con New York M Co	Nevada	4	15	Nov 12	Dec 17	Jan 6	O E Elliott 309 Montgomery St
Goleta M Co	California	1	10	Sept 15	Oct 27	Nov 24	D M Kent 330 Pine St
Gray Eagle M Co	California	20	6	Oct 20	Nov 24	Dec 15	J M Buffington 303 California St
Guasucarau & Cal M & M Co	Honduras	3	10 000	Oct 28	Nov 28	Dec 16	Edward Oliver 22 Michigan Ave, S F
Hale & Norcross M Co	Nevada	96	50	Oct 7	Nov 12	Dec 3	A B Thompson 309 Montgomery St
Mexican G & S M Co	Nevada	41	25	Oct 18	Nov 20	Dec 10	C E Elliott 309 Montgomery St
Mono G M Co	California	30	25	Sept 18	Oct 28	Dec 2	B L Burling 309 Montgomery St
Montezuma M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent 330 Pine St
Morgan M Co	California	14	10	Oct 30	Dec 6	Dec 29	L C Brease 230 Montgomery St
North Peer G & S M Co	Arizona	6	5	Oct 1	Nov 5	Nov 25	Henry Deas 309 Montgomery St
Russell Reduction and M Co	California	7	5		Nov 17	Dec 8	J Morizio 328 Montgomery St
Sterling M Co	California	1	6	Sept 16	Oct 27	Nov 24	D M Kent 330 Pine St
Seg Belcher & Mides Cons Co	Nevada	7	25	Oct 7	Nov 10	Dec 1	E H Holmes 309 Montgomery St
Silver Hill M Co	Nevada	27	20	Oct 8	Nov 13	Dec 3	D C Bates 309 Montgomery St
Silver King M Co	Arizona	4	30	Sept 20	Oct 28	Nov 18	Aug. Waterman 328 Montgomery St
Trinity River T & M Co	California	3	30	Oct 6	Nov 17	Dec 8	Edwin L Griffith 28 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Kentuck M Co	Nevada	J W Few	310 Pine St	Annual	Nov 26
Occidental Con M Co	Nevada	A K Denhron	309 Montgomery St	Annual	Nov 17

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 25
Derbec Blue Gravel M Co	California	T Wetzel	522 Montgomery St	10	May 26
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 23.		WEEK ENDING Oct. 30.		WEEK ENDING Nov. 6.		WEEK ENDING Nov. 13.	
Alpha	1.50	1.75	1 80	2.15	1.75	1.95	1.50	1.80
Alta	1.35	1.45	1.40	1.55	1.40	1.45	1 15	1.50
Andes	2.05	2.35	2.00	2.45	1.70	2.15	.85	1.60
Belcher	3.05	3.10	2.75	3.10	2.70	2.95	2.20	2.65
Best & Belcher	3.30	3.40	3.05	3.60	3.10	3.30	2.70	3.30
Bullion	3 10	3.55	3.05	3.20	2.95	3.40	2.70	3.25
Bodie Con	1.80	3 00	2.25	2.55	1.95	2.30	1.10	1.90
Bulwer	.35	.55	.45	.55	.40	.50	.30	.40
Commonwealth	2.00	....	2.60	....	2 65	....	2.50	2 85
Con. Va. & Cal	4.15	4.70	4.40	4.75	4.20	4.50	3.60	4.45
Challenge	2.60	2.8	2.30	*3.00	2.90	3.10	2.50	3.25
Chollar	3 15	3.50	3.15	3.40	3.60	3.80	3.25	3.60
Confidence	7.00	....	7.00	....	7.00	7.37	7.00	7.37
Con. Imperial	.37	....	.35	....	.35	....	.25	.35
Caledonia	.45	.50	.45	.50	.45	.50	.35	.45
Crown Point	2.75	2.95	2.60	2.90	2.55	2.75	2.2	2 55
Crocker	.25	.30	.25	.40	.30	....	.25	.30
Del Monte	....	....	.80	....	.70	....	.55	.60
Eureka Con	4.00	....	3.50	4.00	4.00	....	3.50	4.00
Exchequer	1.25	1.40	1.25	1.45	1.15	1.30	1.0	1.20
Grand Prize	.30	....	.35	.40	....	....	.30	....
Gould & Curry	2 05	2.35	2.30	2.45	2.20	2.30	1.95	2.30
Hale & Norcross	2.00	2.15	1.90	2.10	1.80	2.00	1.75	*2.40
Julia	.30	....	.30	.35	.25	....	.25	.30
Justice	1 35	1.45	1.50	1.5	1.45	1.50	1.35	....
Kentuck	1.95	2.20	1.95	2.20	1.90	2.05	1.65	1.90
Lady Wash	.45	.50	.49	.50	....	....	.35	.40
Mono	.65	*1.55	1.15	1.40	1.00	1.25	.65	.87
Mexican	3 00	3.20	3.10	3.45	2.85	3.05	2.50	2.95
Navajo	.35	.40	.40	.45	....	....	....	....
North Belle Isle	1.35	1.45	1.45	1.60	1.45	1.50	1.35	1.50
Nev. Queen	.75	....	.85	.90	.90	....	.85	1.10
Occidental	1.70	1.95	1.75	2.05	1.75	1.85	1 10	1.75
Ophir	4.70	5.10	4.65	4.90	4.55	4.65	3.50	4.40
Overman	2 15	2 35	2.25	2.35	2.20	2	2.00	2 25
Potosi	6.12	7.25	6.12	6.62	6.25	7.87	7.00	7.50
Peerless	.25	.30	.35	.40	.35	....	.30	....
Peer	.25	.30	.25	.50	.25	....	.20	....
Savage	3.00	3.30	....	....	2.85	3.10	2.35	2.95
S. B. & M	1.25	1.50	1.25	1.40	1.25	1.30	1.25	1.55
Sierra Nevada	3.00	3.20	3.05	3.4	2 95	3.15	2 30	2.95
Silver Hill	.25	....	.20	.25	.20	....	.20	*.35
Scorpion	.25	....	.25	....	.25	....	.25	....
Union Con	2 90	3.10	2.90	3.15	2.80	2.90	2.20	2.80
Utah	1.15	1.25	1.15	1.30	1.00	1.10	.89	1.05
Yellow Jacket	3.20	3.35	3 20	3.30	3.00	3.15	2.45	3.00

* Assessment delinquent.

Sales at San Francisco Stock Exchange.

THURSDAY, Nov. 13, 9:30 A.M.

500	Alpha Con	1.40	
400	Andes	.90@95c	
420	Alta	1.15	
273½	Belcher	2.00@2.20	
500	Best & Belcher	2.55@2.65	
1000	Bodie	1.20@1.25	
100	Bullion	2.65	
500	Bulwer	40c	
850	Chollar	3.45@3.50	
450	Con Cal & V	3.65@3.70	
500	Con Imperial	30c	
100	Caledonia	30c	
50	Challenge Con	2.60	
200	Con New York	15c	
50	Confidence	6 75	
250	Con Pacific	.6@15c	
475	Crocker	20c	
200	Crown Point	.2.15@2.20	
250	Del Monte	.65	
450	Exchequer	.95c	
225	Gould & Curry	1.90@1.95	
400	Yellow Jacket	2.35	
250	Hale & Nor	...2.05@2 10	
400	Julia	20c	
200	Justice	1.20	
150	Kentuck	1 50	
300	Lady Wash	30c	
350	Mono	.60@65c	
350	Mexican	2.40	
200	N Belle Isle	1.30	
200	N Commonwealth	1.75	
300	Navajo	30c	
600	Occidental	1.10@1.15	
380	Ophir	3 70@3.75	
450	Overman	1.90@1.95	
50	Peerless	20c	
270	Potosi	7.00	
250	Savage	2.35	
250	Seg. Belcher	1.25@1.30	
130	Sierra Nevada	2.40@2.45	
200	Silver Hill	30c	
200	Silver King	35c	
275	Union Con	2.20	
150	Utah	80c	
150	West Comstock	40c	

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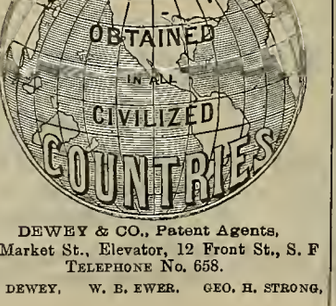
Dewey & Co.'s Scientific Press Patent Agency.



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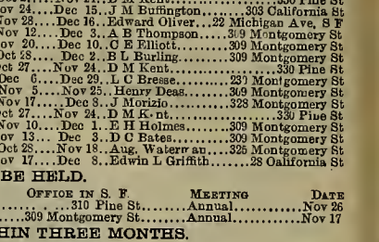
220 Market St., Elevator, 12 Front St., S. F
TELEPHONE No. 658.
A. T. DEWEY, W. B. EWER. GEO. H. STRONG,

TRAFTON'S
Gold Saving Device.
Patented June 17, 1890.



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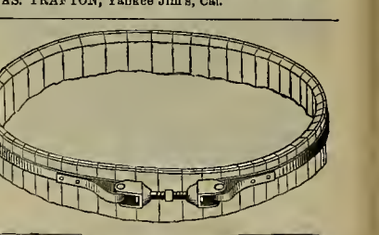

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ANNUAL MEETING.—THE REGULAR annual meeting of the stockholders of the Occidental Consolidated Mining Company will be held at the office of the company, room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California, on MONDAY, the 17th day of November, 1890, at the hour of one o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, November 14th, at 3 o'clock P. M.
ALFRED K. DURROW, Secretary.

Assessment Notices.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 20th day of October, 1890, an assessment (No. 20) of Six Cents (6c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 11, No. 303 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 15th day of December, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

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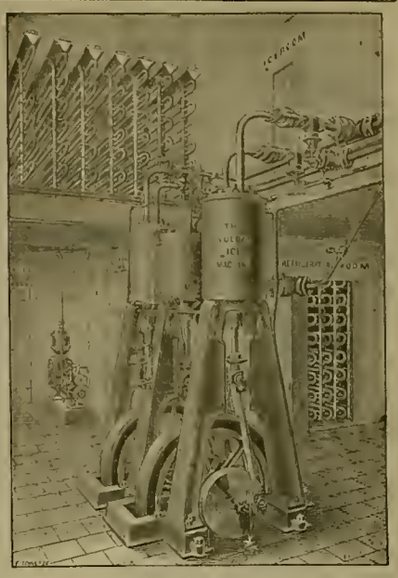

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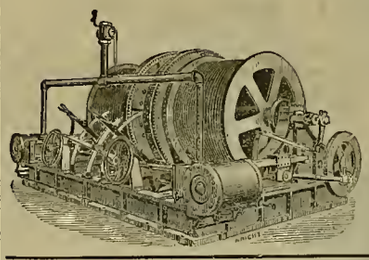

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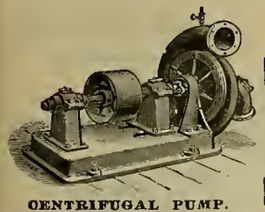

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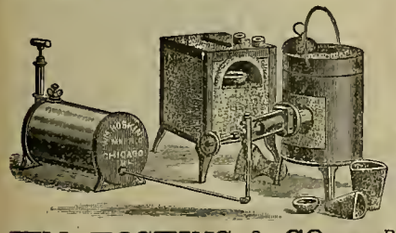

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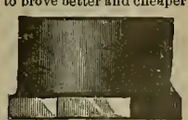

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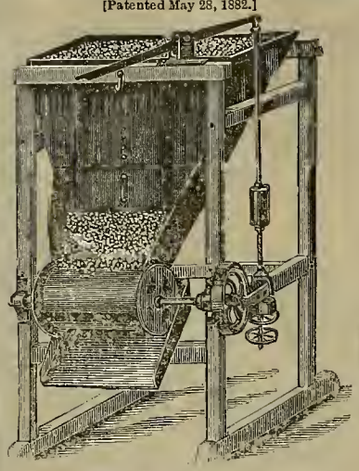

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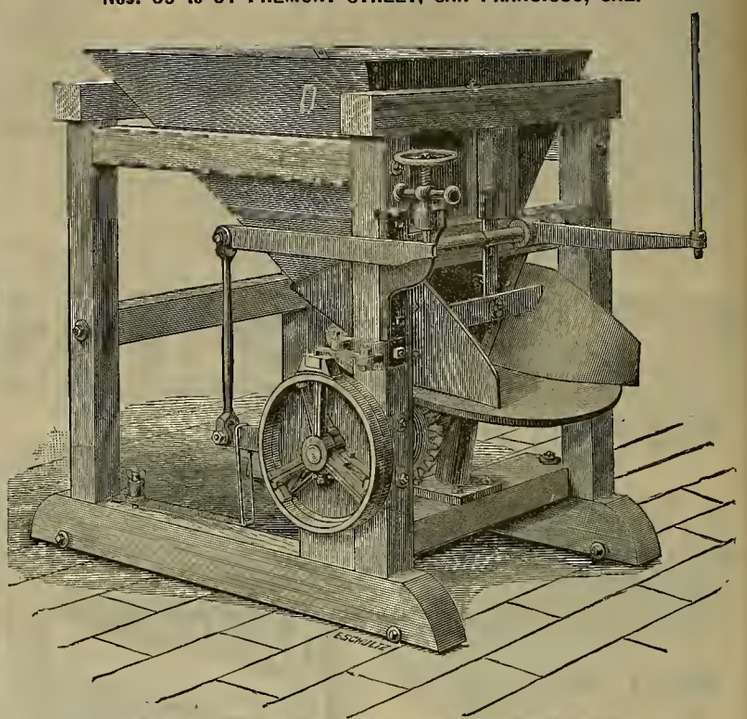

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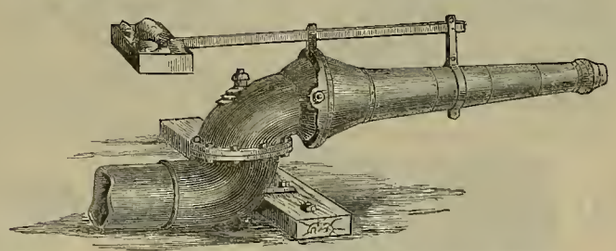

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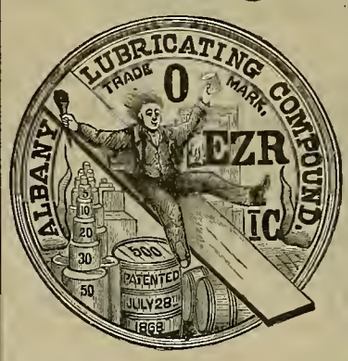

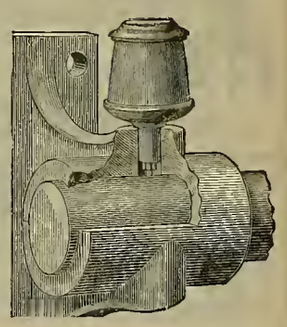

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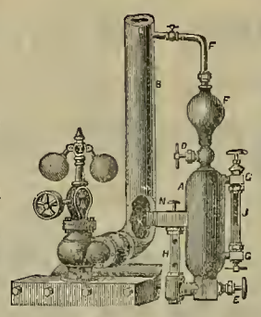

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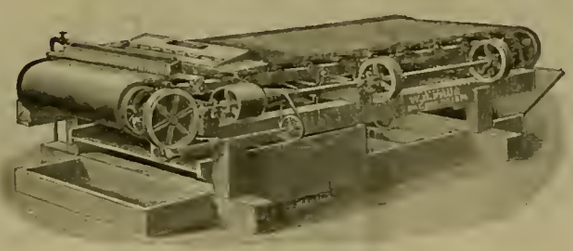

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There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

(PATENTED.)

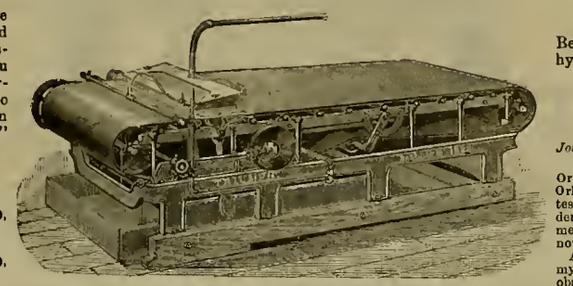
The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Triumphe") can be mounted with a superior belt known as the "Blasdel" Riffled.

—o—

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - - $550 f. o. b.

—o—

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be.
Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentratore is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentratore were purchased, and twenty-eight (28) are now in constant successful operation.

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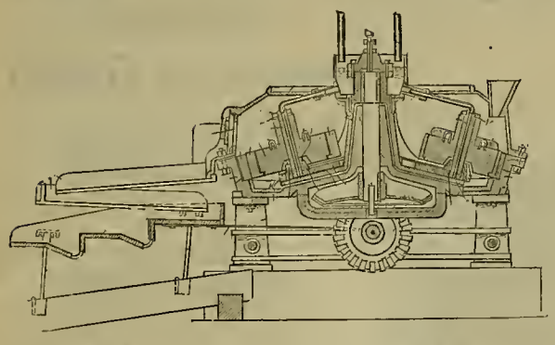

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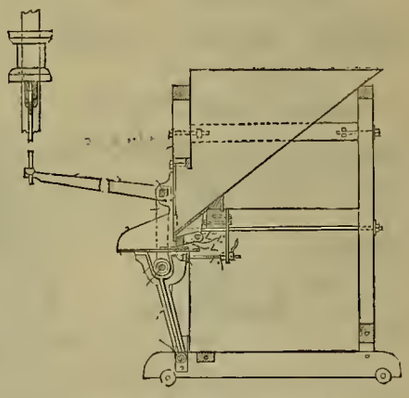

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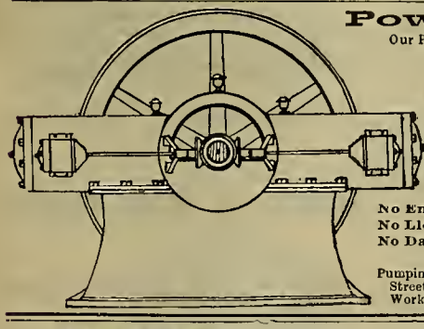

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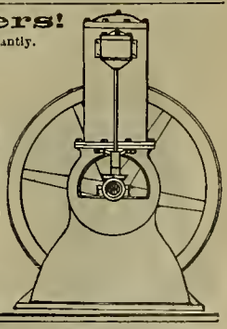

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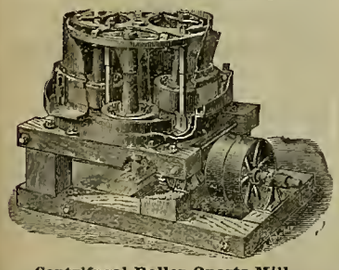

Centrifugal Roller Quartz Mill.

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CENTRIFUGAL ROLLER QUARTZ MILLS,

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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

JAMES M. HAVEN. THOMAS E. HAVEN, Notary Public.

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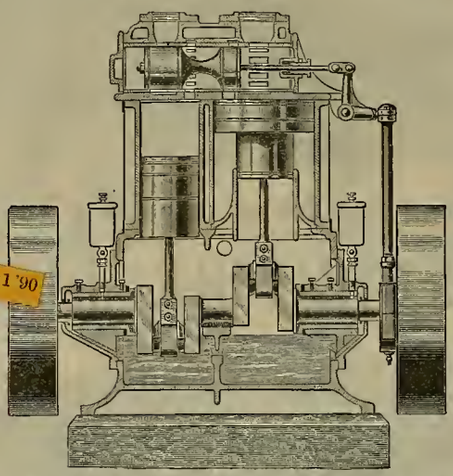

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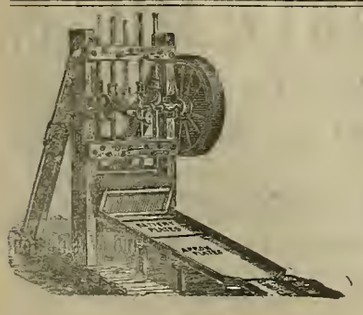

IMPORTANT TO GOLD MINERS!

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 21.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, NOVEMBER 22, 1890.

Three Dollars per Annum.
Single Copies, 10 Cts.

The Rife Hydraulic Engine or Ram.

As Californians more than almost any other people are apt to concern themselves in all that pertains to the elevating of water, whether for motive-power, irrigation or other purpose, many of our readers will feel an interest in a new contrivance designed for water lifting and known as Rife's hydraulic engine, now coming into extensive use both here and elsewhere, the cut standing at the head of this article giving a good idea of this machine as an entirety.

This contrivance, though not new in principle, has been so modified and improved as to constitute it virtually a new machine, all earlier defects having been so entirely eliminated from this that in it the *ne plus ultra* would seem to have been reached in this department of invention. The defects here alluded to had so impaired the old style of hydraulic ram that, while there was a wide field for its employment, its use was comparatively restricted, these defects having to all appearance become chronic.

Through their cure a great impetus has been given to the manufacture of the Rife engine, which is now being introduced to the exclusion of everything else of the kind.

The principal trouble with the old hydraulic machine was the want of an automatic air supply, a trouble that in the Rife patent has been obviated. Increased suction, by means of an elevated base, has also been attained during the action of the ram. Through the employment of rubber-lined valves in the new invention, the jarring stroke incident to the use of heavy metallic valves is avoided; a free escape of water is also provided for, the flow being easily regulated by means of a lever and adjustable weight, these composing but a portion of the many improvements that characterize the new apparatus and commend it to general use.

One of the Rife engines having been purchased by D. B. Hays, can be seen at work on his place near Oroville, Butte county, the manufacturers referring to that gentleman for information as to practical results. These machines are manufactured at Roanoke, Va., by the Rife Hydraulic Engine Company, to whom all communications relative to the same should be addressed.

THE Northern Pacific Railroad is preparing to erect coal bunkers at Sprague to cost $10,000.

THE RIFE HYDRAULIC ENGINE.

Fuel Gas.

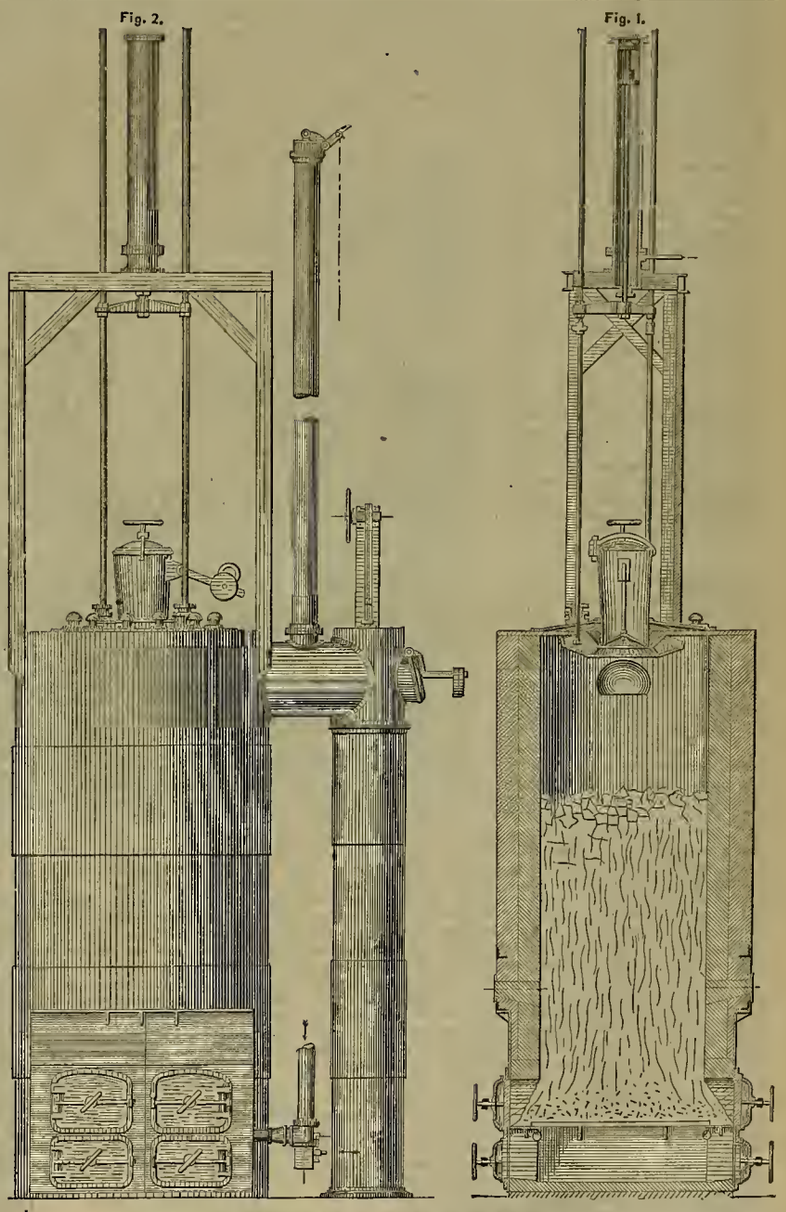
Mr. Geo. W. Goetz of Milwaukee, Wis., in a paper read before the American Institute M. E., in speaking of producer gas, says: Producer gas is undoubtedly the cheapest fuel gas that can be made, and answers all purposes where the air necessary for its combustion can be heated by the off-going heat of the furnace. Tests have shown, however, that producer gas carries too much nitrogen to permit its distribution to a community, since, in consequence of the presence of this constituent, its calorific power is too low, and its flame extinguishes so easily as to be dangerous for household use. It was important to know how many cubic feet of producer gas one ton of coal will give. Conflicting statements as to this point will be found in the literature of the subject, the figures ranging from 150,000 to 250,000 cubic feet per ton.

The accompanying figures show a producer similar to the one used, which was specially designed for a large production of producer gas, and for making a mixture of producer gas and water gas. Fig. 1 presents a vertical section, and Fig. 2 an outside view of the producer. The shell is 20 feet high, 9 feet 2 inches in exterior diameter, and, inside the lining, 6 feet in diameter. The lines of the producer, as shown in Fig. 1, are vertical. This is a good construction for a producer in which many different kinds of fuel are to be gasified; but it is not advisable to copy these lines for every fuel. Experience has shown that the lines to be given to a producer should depend upon the nature of the coal to be gasified therein. Having large cleaning and ash-pit doors on both sides, opposite each other, the producer can be cleaned without great difficulty, even when a large accumulation of clinkers has taken place.

In order to get a gas very low in carbonic acid, a much larger depth of fuel than is generally carried in producers was required; and, as it is impossible to poke by hand such a deep fire, a pneumatic rammer was placed upon the producer. This rammer consists of a cast-iron ring, so constructed that it will not only exert a pressure upon the coal, but also from the coal to the periphery of the producer. The construction is clearly shown in the figures.

KEENE, N. H., is to have a new industry in the shape of an artificial granite manufactory which will build and utilize a building 130x30 feet, two stories high, with engine-room, stock sheds, etc.

Fig. 2. Fig. 1.



PRODUCER FOR FUEL GAS.

What Greeley Would Say.

Were Horace Greeley alive and with us to-day, what, we wonder, would be say to the young man consulting him as to a place of residence and a choice of pursuits? Were some of our young men to apply to the Philosopher of the White Hat for advice as to where they had best go, he would, in view of their worthlessness, very likely tell them to go to "sheol." He could not consistently tell them to "go West," as this, under existing geographical conditions, would be preposterous. This wise man, were his counsel thus sought after, would probably say: "Boys, remain where you are—you need not look for nor can you find any better country than this; stop here and go to work—cultivate good habits and save what you earn." As a first step toward bettering your condition, harden the inside of your palms with a pick or an ax-handle, or some such implement. This done, and all demoralizing practices avoided, you cannot fail to come out right." And now let us say to the youth of California, having virtually followed Horace Greeley's advice by getting as far west as you well can, follow now the rest of his advice; go to work at any honest employment for which you are fitted or for which you can readily fit yourselves; eschew cards, billiards, stock deals and all other hurtful pastimes and forms of gambling, and you will have made sure of all that is best in this life and that which is to come.

THREE of the largest iron and steel mills in the country, Homestead, Braddock and Oliver's, have voluntarily enforced the eight-hour day.

The Gold Belt of California.

NUMBER II.

The Ancient Placers and Their Relation to Wall Rocks.

[Written for the MINING AND SCIENTIFIC PRESS by STEPHEN BARTON, Kernville, Cal.]

The light of experience must guide us in determining what should constitute wall rocks, and why we should expect to find that in certain localities the ancient channel only grazed the outcrop of the gold-bearing matrix and left the great body of its wealth penetrating the earth to great depths. We must remember, however, in the face of experience, that there is a theory that the wall rock is to the lode merely that of the product of the molders' art, that it gives shape merely to a vein of eruptive matter. If this latter is true, then there is no use of studying geological formation, as a gold-bearing lode may be found wherever a rent may occur in the earth's crust. This letter theory is responsible for half the mining failures that have occurred on the Pacific Coast since Marshall's discovery. It was responsible for the squandering of $50,000,000 in the bottom of the Comstock, below the realm of profitable mining, and finds a place in that portion of the literature of to-day published at public expense. A theory which has wrought so much evil should be able to vindicate itself by reference to some one fact established in its favor, or some one dollar secured as a return for the millions squandered, or it should cease to pretend to the position of a scientific truth. Unfortunately such is not the case. Nine-tenths of our mineral lodes fail to penetrate the earth as deep as the gorges of the modern streams. The great mother lode is broken up, scattered, demoralized or absent in the beds of all the rivers it crosses. Few if any of the explorations in the ridges have reached the level of adjacent river-beds; and still we are to be told, by authority, that the talk of "gold ores" must only excite a smile with scientific men, and that gold is found only in positions consistent with mechanical deposit by eruptive force.

Gentlemen, stand aside; don't allow yourselves to remain a drag-yoke upon the neck of civilization. We will show you that gold is found in certain fixed geological relations; that it exists as a metal, and that it also exists "as an ore;" that it enters into the most intricate combination with many minerals; that it observes the laws which govern the brotherhood of metals, and confuses you only by the fact that it is obnoxious to oxygen.

What rules, then, must govern the geology of a mineral region, and where may we safely look for a paying ledge?

As being first in mineral wealth we will take the calcareous formations. If a lime belt or formation occurs 100 miles wide and of great depth, with no adjacent metamorphism and no intervening formations, the galenas will only carry a low percentage of silver and a bare trace of gold, except near the edges of the formation, nothing more. Where lime dikes of moderate width contact with mica slate, talcose slate, or any of the highly silicified or metamorphic rocks, whether eruptive or otherwise, minerals containing any or all of the metals may be looked for in or near one of the contacts. This rule may be carried up through all the grades of calcareous and carboniferous slates. In many places numerous small veins rising in the granite a mile away will be seen heading for the contact and expanding into a complicated system as they approach. But as most of these lime formations trend south about 24° east in California, and as there is a very marked difference between the conditions observable in the two walls, I will leave the explorer to determine for himself some of the mysteries hidden there. For 15 years I have been fully impressed with the idea that the vicinity of the calcareous contact not only gave birth to a high percentage of the gold of the ancient placers, but that the adjacent lime, acting upon the silex and sulphur of the matrix, released the gold and offered it to the current in its present form.

I have no theory to which I have not been involuntarily led by observing facts. So far as my observations go, what is known as pocket mining, where fortunes have been realized in a day, were all near the contact of a calcareous formation. If we accept this as a rule, we shall see how very little of the wealth of the earth's crust is exposed to man's grasp. Take the bed of Owens valley, where the granite end the silurian rocks meet. We see this decomposition is going on, the sulphur, the lime, the silex and the soda, the boracic acid and potash, are being carried forward by decomposition; but the contact itself is left to the realm of seismic forces. On a smaller scale the same rule will apply to the valley of Kern river below Kernville. This latter formation expands a few miles to the southeast of Kernville, and before dipping beneath the desert near Mojave station, on the railroad, is seen to offer one of the most promising of unexplored regions, and from its trend is doubtless part of the system lying east and north of the San Bernardino range. There may come a day when the tremendous amount of oxygen required to metamorphose those older rocks and give them a granitic cast may inflate the Owen-river region into a mountain, and then there will be good mining there. While the lime itself will not be metamorphosed into granite, it will yield up its sulphur now combined in the form of gypsum and become a more perfect granular mountain limestone.

When we see where granite has been in the melted form, and has run in a regular flow, and now reposes on the broken outcrop of vertical slate; when we see silurian slate half metamorphosed into granite; when we see the immense gain of oxygen in these altered forms, and see the escape of sulphureted hydrogen from the contact, and conclude that for a certainty water le surrendering its oxygen to the granite, we say this is the place where granite is made; and when the action is rapid, the movement shakes the world. Such forces have elevated vast areas and have left us dead-river channels far above the beds of modern streams. In the conversion into granite the bulk of the rock is nearly doubled, while its ponderosity is increased, there being in a cubic foot of granite once and a half as much weight of oxygen as the whole weight of a cubic foot of water. In a Pickwickian sense, our lost rivers may be said to be engaged in the laudable work of elevating real estate.

There must have been a time when silex and sulphur were combining with metals and forming themselves into solid lodes. There doubtless was another time when this same sulphur, under other circumstances, was aiding to decompose the quartz and to soften the walls of the lode. It required millions of years to work these changes. While these changes were going on the forces employed were converting the lode into one vast voltaic pile, the earth itself was a vast magnet, and these, acting in harmony with the law of affinity, which gives to each angle of crystallization its own substance, were drawing the atoms into grains.

The forces which elevated the ancient river-beds may have hardened subjacent formations, and the incasing walls of the lodes which imparted their wealth to the ancient rivers may have been soft and friable. The sulphurets in the lode may have been decomposed and the gold thus exposed to the current as denuding occurred. On any smaller scale we know such chemical changes would beget electric currents, and we know that the earth is a great magnet. We know that the electric current revolves only upon the surface of the magnet. We know, further, that wherever met with it is engaged in transferring metals in solution. Let us add now one other fact. Eruptive forces have not occupied the metal-bearing fissures since the formation of the matrix only to destroy it.

There may be chemical agencies at work in regions noted for the display of eruptive force. There are certainly chemical agencies at work where no such force has ever been directly manifested. Perhaps it will be urged that the two forces differ, mainly in intensity. I grant this affinity of origin, yet the presence of an eruptive force is not the place for the formation or the perpetuation of the gold-bearing matrix. Let us learn to discriminate between chemical and physical results. Let us learn to scout the idea that the fighting qualities of the soldier are fortified by mixing gunpowder with his brandy.

If the earth is a great magnet and magnetism has anything to do with fixing the position of the metal in the lode, then there must be a difference in the character of the deposit on the two sides of the lode. Some one will say, "Oh, yes, there is a difference between the foot and the hanging-wall, but what I want to know first is which is the hanging-wall? The magnetic needle points to the north. Electric currents run at right angles with the course of the magnet. Now how do these suggestions fit the information about the hanging-wall?" Let us change the form of inquiry. "Is the diabase in the west wall, or is the great field of granite there? Is there calcareous slate or serpentine back of the diabase?" Let us know something of the surroundings. Never mind the "foot and hanging-walls," except you give something of these. We have started out for original research. We have squandered our money by following a beaten path long enough. The object was to try to give some suggestion as to where the gold of the ancient placers came from. It was not intended to refer the mining public to Webster's dictionary for the information, nor yet to Dana's "Elements of Geology." The object of the discussion is to try to discover something which no one knows, and yet what every old placer miner would like to know.

(To be Continued)

EIGHT HOURS A DAY.—Regarding the enactment by law of eight hours a day, or 48 hours per week, as the maximum amount of work for adults, it may not be uninteresting to make it known that in the weaving factory at Edenderry, near Belfast, which is the property of Messrs. John S. Brown & Sons, who are well known among the foremost in the production of the finest damask table-linens, doylies and cambric handkerchiefs, the question has been put to a practical test by their enterprising manager. Some two or three years since, Mr. Kirtland, the gentleman referred to, became impressed with the idea that he could reduce the period of weekly labor to five days, and give an entire holiday on Saturdays to all his workers without injuriously affecting the interests of either master or employe. Having now had two years' experience, although the system was only at first tried as an experiment, he finds that all concerned are so well satisfied that they would, on no account, return to the old method. Briefly, the advantages gained have been: An output equal to and even greater than before; the saving of steam, fuel, oil, etc., to the firm and to the workers; Saturdays to themselves, with wages equal to what they formerly earned in six days, because knowing they would be off on Saturdays, they are as anxious to make up their pay as their employer is to grant it. It has also been observed that there are fewer absentees on Monday mornings, and far less broken time. Should any employer or manager wish to try the experiment, particulars of the method of arrangement and system of working it may easily be obtained. It may serve better to elucidate the pros and cons of the discussion than hours spent in theorizing on the platform of St. James' hall.—*Journal of Fabrics.*

SENATOR SHERMAN'S PROPHECIES.—Senator Sherman spoke at the Old City Hall, Pittsburg, Saturday night week, to 4000 persons. In discussing the tariff, he said: "My fellow-citizens, I am as positive as I am of my existence to-day that within ten years from this time we will produce every pound of sugar that is used in this country on our own farms. [Applause.] The farmer will raise the product, and the manufacturer will build these great machines to press out the juice and reduce it to sugar, and thus a great industry, probably employing 100,000 people in this country, will soon be built up in our country. We have put a duty on tin plate equal and a little more than the duty on sheet iron, and the result is we will manufacture in this country of ours within a very short time—and you Pittsburg people especially, because it was largely upon your influence and upon the influence of others that it was done—we will make within five years of this time 360,000 tons of plate tin, and we will make the tin cup so cheap that nobody will growl but the Democrats. Why should not we do it? I am told that now already in Baltimore they are getting ahead of you. They have a capital organized of $7,000,000 to go to work to make tin plate, of which we import now 360,000 tons, and if you Pittsburg people don't hurry up you will get behind in this race, and you ought to be in the lead."

TRANS ANDINE RAILROAD.—The year 1892 will probably be signalized by a most interesting event in civil engineering and in international overland commerce. This will be the completion and opening of the Trans-Andine railroad, the first to cross the continent of South America. It is 19 years since this work was begun, and it is now confidently expected that it will be finished by the beginning of 1892. The road is to run from Buenos Ayres to Valparaiso, a distance of 871 miles. There are now 640 miles of it finished at the Buenos Ayres end, and 82 at the Valparaiso end. Of the remaining 149 miles about one-third is practically complete, and the rails laid. The passage of the Andes is accomplished at the Cumbre Pass, which is 13,045 feet above the sea level. The railroad, however, does not reach the summit of the pass, but pierces the mountain by means of a tunnel more than three miles long at an elevation of 10,450 feet above the sea. The grades are, of course, very steep. For a considerable distance the rise is more than 422 feet to the mile, or 1 foot to every 12½. On this portion of the line a rack rail is employed similar to those on the Hartz and other mountain roads. One unfortunate feature of the road, which will seriously impair its value, is the diversity of gauges adopted. The different sections of the road have been built by different companies, and each company has its own gauge.

MR. JOSEPH M. HIRSH, the chemist who claims to have a process for extracting aluminum from common clay, has again been heard from. This time he is alleged to have confided his process to a Chicago newspaper reporter, whom he first swears to secrecy. He is quoted as saying: "I have solved the problem of extracting the metal (aluminum) from an *aqueous* solution; the process has been so simplified that it is exceedingly cheap (a few cents a pound), and requires but little labor." In the face of this statement of the simplicity and cheapness of the process, Prof. Hirsh is taking steps to receive the benefit of a very extensive backing; the Chicago Aluminum Company, which he is organizing, is to be capitalized at $1,000,000. Prof. Hirsh may have a process for manufacturing aluminum, but until he explains to the scientific world the manner in which he proposes to obtain aluminum from an "aqueous solution of common clay," he will not receive much credence among chemists, nor, it is to be hoped, much support among capitalists. We have received a long and irrelevant communication from Mr. Hirsh which in no way replies to the doubts cast upon the character of his enterprise. So far as our investigations have gone, we have no reason to modify our advice to investors that this is an excellent thing to let alone.—*Eng. and Min. Jour.*

IT is estimated that wheat and hops will bring into the State of Washington this season about $12,000,000, lumber and coal about $15,000,000, and that railway construction will bring in $20,000,000 more within 18 months. Add to this the receipts of ore, fruit and minor products of this wonderful State, and some idea of the wealth of Washington may be formed.

FALL RIVER citizens are discussing the project of erecting a large building on the lot adjoining the postoffice, to be rented to small manufacturers with power. The scheme is feasible and is meeting with much favor.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XX.

[Written for the PRESS by JAMES H. CROSSMAN.]

The Silver Valley Land and Water Company—A Submerged Dam.

In a former article of this series we referred to an important enterprise that was being inaugurated for the purpose of diverting and utilizing the sub-surface water of the Mojave river, which, during the summer season, is largely absorbed by the loose, gravelly sands in its bed—the water in this stream appearing and disappearing several times until it finally disappears in what is known as the sink of the Mojave.

At the date of the writer's examination of this property, four months ago—though the scheme had been ascertained to be thoroughly practical and the organization of the company was completed—the work of development was in an embryo state, little having been done. Since that time the energetic managers and promoters of the enterprise, Messrs. Rhea and Silver, have with a large force of men excavated a long line of canal and prepared the river-bed for the commencement of their dam, which will take from two to three months to complete. The conservation or reclamation of sub-surface water by the so-called "submerged dam system," though to us new, is by no means a modern invention—it having been practiced for many hundred years in the sandy deserts of Egypt and India, and the waters used for irrigation purposes—bountiful crops being raised where before nothing could be produced. It is a well-established fact that wherever deep soils are found in a desiccated country they are wonderfully rich in the element of fertility, provided water can be procured for irrigating them. The originators and promoters of this scheme, Messrs. Silver and Rhea, are deserving of great credit, as it has now become an assured fact that the work will be speedily completed and water be running in the canal early in the coming year. It is a truism but none the less true saying that the man who makes two blades of grass grow where but one grew before is a public benefactor; and these gentlemen, assisted by their company, propose redeeming a large area of territory that is now barren and valueless.

As an enterprise of so much importance requires more than a passing comment, I will furnish a detailed description of their *modus operandi*, specifications and plans, for the benefit of your readers—there being many other localities where the same system can be advantageously used.

The Dam.

One thousand six hundred feet long from rim to rim of the river channel, has a minimum depth from water level to bedrock of 2 feet 2 inches; maximum depth, 24 feet; mean depth, 12 feet; depth from surface to the water-carrying stratum from 0 to 8 feet. The bedrock proper is composed of a micaceous granite, overlaid by from 2 to 6 feet of tough clay.

The preliminary or holding dam will be constructed of a double row of sawed piles of Oregon pine, with lap joints of the following dimensions: The lower row to be 6 by 16 inches; the upper lap row to cover joints 4 by 12 inches. Iron caps to be used in driving, if needed, end shoes if required to penetrate the formation overlying the bedrock.

After the completion of the pile dam and the water and sand are held in check, there will be built below it a solid dam of masonry composed of rock and cement. There being no rocks or bowlders in the river-bed, the piles can be easily driven to bedrock.

The Canal.

This portion of the work, which is being constructed 30 feet wide on top and 20 feet on the bottom, is designed to carry a mean depth of 5 feet of water. The bottom of the dam at its head will be 4 feet below the water level in the driest season of the year. The width of the canal at its head will be 100 feet, gradually decreasing until it reaches its normal width, thereby giving a free opening for the ingress of the water. The capacity of the canal is estimated at 18,000 miners' inches, which can be increased to 25,000 by building dikes or levees for 300 feet along its lower side. Above the head of the canal, at a proper distance, a jetty or breakwater will be constructed of sufficient strength, hight and length to divert the flow of both water and sand with proper gates to admit the water if required.

The Formation

Filling the river-bed is as follows: The water-carrying strata contains of

	Per Cent.
Water	22
Rock, average size of 4 inches	16
Rock, average size of 1½ inches	36
Sand and small gravel	26
Total	100

The grade of the river at this point is 14 feet to the mile; grade of canal, 3 feet to the mile; formation on line of canal for three miles is a stiff clay, ½-mile rock.

At the point of discharge the canal commands a 45-foot drop of its contents, which gives that much pressure head. At this point sufficient water will be taken from the canal to propel a Pelton wheel which will be used to drive motors and dynamos, as much electric-power

being generated as may be required for manufacturing, milling and other purposes, either at the point of discharge or at any other points within a radius of six or eight miles. This power can and undoubtedly will be utilized for reducing the almost inexhaustible quantities of low-grade silver ore that exists in the Calico mountain, but which cannot be profitably worked by steam, with coal costing from $9 to $10 per ton, as at present. The tufa belt alone of Calico, which is at least 3½ miles long by 200 feet wide and of unknown depth, would produce ore enough to run 100 stamps in all probability for a generation. The ore is soft, and so situated that it can be worked by quarry for a long time. It is free-milling, but low grade. There are now steadily running on Calico ores over 100 stamps, reducing 300 tons of ore daily, using steam for a motor.

The point referred to as the discharge point of the canal is in close proximity to the Waterloo mill of 75 stamps, 3½ miles from the Barbee and the Runover mills, and but a short distance from Daggett, on the line of the Atlantic & Pacific R. R., forming a suitable place for reduction or smelting works on an extensive scale, as it would command the ores of a large area of mineral country—gold, silver, copper and lead. At a point 11½ miles below the above, a reservoir site has been located having a capacity of 20,000,000,000 gallons, which can be dammed at a nominal expense and be used to irrigate an immense area of agricultural land. Dimensions of reservoir site, 3 miles long, 1½ miles wide, maximum depth, 80 feet, mean depth, 30 feet.

Such surplus water as will not be required for power purposes will be conveyed in a canal to the above-mentioned reservoir a farther distance of 10 miles. The canal for the entire distance commands a tract of irrigable agricultural land 20 miles square. The soil is deep and of wonderful fertility, only requiring water to germinate the seed. It is especially adapted to the culture of the fig and raisin grape. The dryness of the atmosphere and absence of rain during the summer months assists in curing the grape. The soil is also adapted to the growing of all semi-tropical fruits—the date palm, orange, lemon, etc. Wherever water can be obtained, six crops of alfalfa per annum can be produced. Each acre will yield from two to three tons of barley or of the other cereals.

The sweet and the Irish potato and all other vegetables do well here. Fruit matures in this region from two to six weeks earlier than in Los Angeles, and is one day nearer the Eastern markets, making a saving on freight alone of $100 per carload.

On the completion of the Utah Southern R. R., which will soon be extended to a point near Ploche, Utah coal suitable for smelting can be delivered at Barstow for $5 per ton, which will greatly assist in the opening up of a large extent of mineral-bearing country in this section of the country, most of which is now valueless, though known to be rich in minerals.

(*To be Continued.*)

THE railway mail service of the United States has during the past 2½ years been increased at a most wonderful rate. Fully 25,500 miles of new road were added. The greater amount of new routes was in the West. By attaching mail cars to the fast-limited trains all over the country a much more expeditious delivery was secured. New York and San Francisco have thus been brought a day nearer to each other,

What Constitutes an "Accident"?

The full-page engraving—"Accident in a Machine Shop," reproduced in this paper last week, was not only a pathetic picture but a very suggestive one.

Nearly every morning last week readers of the daily papers were treated to one or more railroad disasters, with a regularity that would have been monotonous had they not in every instance involved losses of life, limbs and property.

Only a few days ago a lake steamer was burned, causing the deaths of eight persons.

And these were not a tithe of the so-called "accidents" that happened during the week in the Northern States.

The question naturally arises, Is it necessary that these casualties occur so frequently, and with such regularity? We hardly believe, with the guide of our youth, that "there is no such thing as an accident"—by which he meant that all casualties are the result of human error, such as miscalculation, drunkenness, carelessness and misbehaviousness. Yet, in a large proportion of the cases reported by the press, were they all traced to their sources, one or more of these causes would be found responsible for these occurrences, as they have been for many generations past, and probably will again in years to come.

It may be that "corporations have no souls," and, consequently, no more responsibility for the lives and limbs of those intrusted to their care; but the steamboat or railroad company which confides the care of its passengers and employes to a drunken or careless engineer and fireman, is at least responsible for its own losses, and should be considered so for the losses of others whose lives and property are thus placed in jeopardy.

There should be stronger, surer safeguards thrown about the traveling public than now exist. If the corporation managers are responsible, let them be held so by the authorities, and if the subordinates have infringed the regulations made by the managers, let the proper penalties be visited upon them. The public is not supposed to know where the responsibility should lie; neither is the ambitious reporter, who generally assumes too much on the start and goes off at a half-cock, only to confuse all the after proceedings and mislead his innocent newspaper readers. But the truth should come to light and the thugs of justice be felt, let the blows fall where they will.

So in the great machine-shops of the country, from business manager to shophoy, there should be some one held responsible, directly or indirectly, for every casualty, and every disaster be traced to the guilty party, even to the outside dealer who supplies the defective belt or the fractured gear-wheel.

On the other hand, there are sometimes mysterious occurrences, usually termed "divine providences," over which human foresight and human precautions have no influence. But these instances are rare. Accidents do not often happen without a tangible cause. A man may be stricken down by lightning, and if there has been no heedless exposure of his person to the electric current, the responsibility cannot rest upon himself or any other person. But it would be very difficult to place the unfortunate in any other circumstance so utterly devoid of human responsibility as that. And if human responsibility is at fault, it should stand or fall before the influence of public opinion.—*Chicago Journal.*

Exploring the Canyons of Colorado.

Colonel Holabird, of Los Angeles, has just returned to California from an exploring expedition in the canyons of Colorado. He penetrated districts never before explored, it is said, and found in an almost inaccessible canyon 100 miles north of Williams, and near the Grand Canyon of the Colorado, the Yava Supai tribe of Indians, who had never seen any white man except John D. Lee the Mormon, who was shot for the Mountain Meadows massacre. Colonel Holabird in relating his experiences to a New York *Tribune* correspondent, said: "These Indians are of the Apache family, but of ancient origin. The men are magnificent specimens. The valley in which the tribe has lived for many years in seclusion has only two ways of approach. It contains 2000 acres and is inclosed by almost perpendicular walls 4000 feet high. We traveled over 15 miles along a canyon over a lifeless country. Suddenly we came to two boiling springs under cottonwood trees. From these springs a river starts, which winds its way through a luxuriant valley. The water in the river is as clear as crystal and so strongly impregnated with lime that it petrifies everything it touches. There are three immense cataracts in the canyon. These look as if centuries ago a huge cottonwood tree had fallen across the stream and lodged. Mosses, ferns and creepers formed a barrier; all these turned to limestone. The grass caused the deposit to increase until the barricade extends across the canyon making a fall of 250 feet. Along the front of these high cataracts limestone ridges have formed 20 to 50 feet one above the other. Over all these the water falls like a sheet of glass. Underneath, between the ridges, thousands of plants with flowers in full bloom are seen, while millions of humming birds dart in and out. The chief of the strange tribe is an old man of 60, 'Captain Tom.' The name was given him by John D. Lee. I found these Indians in a starving condition, subsisting on berries and grass seed. I appealed to the Government for them, but the Indian Department said it couldn't help wandering people." General Miles, who says he has heard of these Indians, but could never get a guide to their canyon, will investigate their condition.—*Phila. Public Ledger.*

PRIESTS AND POLITICS IN JAPAN.—The position to be taken by the priests of the various Buddhist sects in Japanese politics, and especially during the first general election, has been a matter of much interest, in view of the widespread influence, the energy, activity, and occasionally exceptional ability, of members of the Buddhist priesthood. When the text of the constitution was under consideration the famous Monto sect sent delegates to Tokio to urge the authorities to allow their Order the right to elect and be elected to the House of Representatives. A politico-religious association known by the high-sounding title of "Sovereign-reverling and Buddha-believing Grand Combination," which has recently been established, is supposed to be mainly composed of priests. However this may be, the chiefs of all the Buddhist sects lately met in one of the principal temples of Tokio to discuss the subject of the priests' duties in regard to current practical politics and to lay down certain rules for their guidance. The result of the conference was a series of resolutions to the effect that no priest should be permitted to join a political party, that a priest should under no circumstances whatever be allowed to labor for a political party, and that every priest should be enjoined to warn his flock against the danger of allowing political differences to interfere with social intercourse, and against breaking the law through political zeal; and that under no circumstances shall either the principal hall of a temple or any other sacred building be lent for the purpose of holding political meetings or delivering speeches connected with political parties. These resolutions, with appropriate instructions, have been circulated by order of the head of each sect to every Buddhist priest in the country.

What Invention Does.

The great perfection attained in cotton manufacture and its wonderful development within the past century, are due to the inventive skill and untiring energy of the mechanicians of this country. In 1793 the saw cotton-gin was invented by Eli Whitney, a citizen of Georgia, and the importance of this invention to the cotton manufacture cannot be overestimated, for it was the one thing needed to insure a sufficient supply of the raw material to meet the requirements of the increasing machinery for spinning and weaving. The result of Whitney's invention was the rapid extension of the culture of cotton and its permanent establishment as one of the leading staples of the country. Previous to the introduction of the "saw-gin," lint cotton had been separated from its seed by the use of what were known as "roller-gins." The process was almost identical with that in use in India centuries ago, and was slow and expensive, whereas the new gin separated lint from seed in much less time and at much less cost than had been done by the old plan; as it also increased the quality of lint made from "seed cotton," it is easy to see how this invention greatly enhanced the planters' profits, and thus gave a great stimulus to cotton-planting. The first establishment of which special mention should be made was that of Samuel Slater, whose centennial has just been celebrated, who made with his own hands a series of Arkwright machines and started at Pawtucket, R. I., a cotton-spinning factory. Taking the waterwheel of an old fulling-mill, he used it to give power to three carding, one drawing and roving machine, and 72 spindles. As the cotton of the Southern States was then badly cleaned, his supply was drawn from the West Indies, and in 1794 he made the first cotton thread, and from the small amount of 500 bales consumed in 1800 the industry now finds employment for over 200,000 persons and uses over 2,000,000 bales of cotton.—*St. Louis Dry Goods Reporter.*

GLASS HOUSES AT SAN GABRIEL FOR THE PROTECTION OF VEDALIA CARDINALIS THROUGH THE WINTER.

MR. W. BARNET LE VAN has for years been laboring at a system of pneumatic propulsion for passengers as well as for freight. London has a pneumatic freight line which carries a car five miles in seven minutes, and Mr. Le Van is assured that the darkness is the only unpleasant feature of the trip. He anticipates that within a few decades a pneumatic tube line will carry passengers from Philadelphia to New York in 20 minutes. In fuel and other respects he looks for a large saving. Mr. Le Van concisely explains his plan, and such a plan may be possible; but as Macaulay well says: "Any statement, not involving a contradiction in terms, *may* be true." The world has grown as weary of air-navigation schemes as of alchemy. Every new project dwells on the fact that ideas once ridiculed have found universal acceptance and ignores the corresponding fact that ideas once popular have failed to stand the test of time. With two of Mr. Le Van's statements, however, we express our fullest concurrence: "Some objections may be raised to underground roads of this kind. For instance, persons of a nervous temperament would probably be timid about trusting themselves in the cars at first."

THE Director of the Mint has promptly explained in his letter what the Mint has done in answer to the complaining stockholders of the Comstock. Undoubtedly these gentlemen will, in due time, give their view of the case and state the reasons they have for considering as unsatisfactory the investigation of the Carson Mint, referred to by Director Leech; and if they can show good cause for asking it, we have not the slightest doubt the Director of the Mint will do anything that may be necessary to keep the management of any and all of the local mints above the reach of suspicion.

ANOTHER English syndicate has scooped up more important industries in this country. The new company is known as the American Stove and Furnace Company, and have secured control of the Magee Furnace Company of Chelsea, Mass., the Smith & Anthony Stove Co., and other small concerns and mills to consolidate them. They have a capital of nearly $2,000,000.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

SUTTER CREEK.—*Ledger*, Nov. 15: Everything about the Wildman mine is looking fine. The new addition to the mill was started yesterday, making 30 stamps in all. The entire mill is in first-class order and runs well. The rock-crusher is in position directly at the landing. The ore goes through the crusher and into the large ore-bin and is taken out through gates and run into a car which runs on a track laid on the ground to the mill, a distance of 30 feet, where there is an elevator which takes the ore up to the level of the hoppers, a distance of 22 feet. Directly at the top there is a turntable, which facilitates turning the car in the direction of the mill. The power for running this elevator is furnished by means of water in an inch gas pipe. The amount of water used is almost unnoticeable, and raises the ore to the top in the short space of 15 seconds. This is Mr. Tregloan's idea, and is considered an excellent plan. At the Rose mine they are still running east, in the hope of crosscutting something, but there is nothing encouraging in sight as yet. They think, however, that they must strike something very shortly, otherwise there is very little hope of success. The Sutter Creek mine is still forging ahead. The new ten-stamp mill is running and everything in and about the mine and mill looks very prosperous. They are milling ore from a ledge 20 feet thick in the stopes, and have 11 men on the pay-roll. At the North Star, crosscutting still goes on. They are in a considerable distance east and west, but there is nothing in sight as yet. The Lincoln mill, after a rest of two or three weeks to enable them to enlarge the ditch, etc., started up again last week and will likely run steadily all winter.

A RICH STRIKE.—About a week ago George Morgan put some men to work on a quartz claim owned by him on the south slope of Duncan Hill, a little more than a mile west of Auburn and not more than 100 yards from the famous Moore mine. Last Wednesday they struck some fabulously rich rock and took out that day what is estimated at from $1000 to $1400.

Calaveras.

WEST POINT.—*Chronicle*, Nov. 15: The mines are all running steady and are doing better than ever. Mr. Watkins has got his new machinery up and is sinking his new shaft on the Smith ground. I believe he will have a good mine. Billy Cook and Will Elliot have been taking out some very rich rock from their claim near the Peasley mine. It is in a good section and I predict there is a chance for them to take out a barrel of money.

ABOUT MURPHYS.—Quartz and gravel mining is looking up in the Murphys mining district. Considerable prospecting is being done, and in many instances the results are excellent. The last cleanup at the Union Shaft mine on Central Hill amounted to over $2000. Operations have ceased in the Sheep Ranch mine pending the overhauling of the mill.

El Dorado.

A MILL TO GO UP.—Georgetown *Gazette*, Nov. 13: The Van mine, a half mile north of town, which has been thoroughly prospected during the past summer by Thos. Newlands, is about to be worked on a more extensive scale. A force of men came up Saturday to begin the work of putting up a mill and sinking on the lode. The lode is about 20 feet in width and has been uncovered for several hundred feet. The ore is a soft material and prospects well in free gold. We are well pleased to learn that the management is in practical hands.

Inyo.

AN INYO DIVIDEND.—*Index*, Nov. 10: At a meeting of the Board of Directors of the Newtown Mining Co. held in Carson City, Nevada, Oct. 29, 1890, a dividend (No. 1) of five cents per share, aggregating $5000, was declared, payable immediately. This is the company which is working the Dunphy and Keefe mine at Cerro Gordo, and indications are very favorable for a long series of regular dividends.

MODOC CON. CO.—Since work was resumed have shipped two carloads of ore; 1st carload, $1990, 2d carload, $2274. The ore keeps improving, last returns being $7.40 gold, 169 ozs silver and 51 per cent lead. Twenty-three men are employed at an average of $3.50 per day. Have quite a body of pure galena in the Confidence mine, 18 inches wide, averaging 247 ounces silver per ton and 80 per cent lead. Will ship one carload of this ore on Nov. 5.

SYLVANIA DISTRICT.—*Register*, Nov. 16: Work in the Liberal tunnel in the hill northwest from the Liberal shaft has been suspended, and the two shifts in the Climax have been put on ten-hour shifts. Drifting in the Liberal shaft is being vigorously prosecuted. It is the intention soon to resume sinking this shaft and continue it down to a depth of 300 feet. Messrs. Ramez and Thourot, owners of the International mine, located east of the Liberal, have been working it during the summer and fall, and have a shaft down 85 feet, doing their hoisting with a windlass. They have a fine-looking prospect in the mine, and now have about ten tons of clean, closely-sorted ore sacked ready for shipment, which they will send to Salt Lake for reduction. Shoemaker and Hession have just finished burning five large coal-pits, containing some 10,000 bushels of coal. This coal was burned on the word of the local managing agent, but as there will be no immediate use for it here the owners are talking of hauling it to Owens Valley. Kinkead has suspended work on Carbonate hill for the winter. During the sunshine hours we are favored with summer-like weather, but the nights are freezing cold. This place has an altitude 400 or 500 feet higher than Bodie, but being so far from the Sierras it is not so cold here as there. The elevation of the bed of Sylvania canyon at the point where the California-Nevada boundary line crosses it is 8760 feet. The rains of three or four weeks ago and the cool weather have caused an increase of water in the springs and wells, filling the latter nearly to the top.

Nevada.

THE HYDRAULIC MINES.—*Tidings*, Nov. 12: Hustler & Sons of Chimney Hill in Bridgeport townsbip are building a dam in South Shady creek, and when it is completed, about two weeks hence, will resume hydraulicking in their claim there. The Eureka Lake & Yuba Canal Co. are building a dam in Spring creek and expect to have it finished in a month, when they will start up the Columbia Hill mine. Both of them are rich. The dams are being built in a solid manner and so that there will be no overflow. A sunken shaft inside the reservoir, the top of which is near the surface, will carry off the surplus water. The work on the dams is being supervised by agents of the Anti-Debris Association and they express satisfaction with the durability and utility of the structures.

COE MINE.—The Coe mine has been pumped out to the bottom (500 feet) and has been repaired wherever found necessary, and is now being cleared of the debris that has accumulated at the bottom. All the upper levels are in good shape for working, and the 500 level will be as soon as the dirt is cleared away. This level has never been opened to any great distance.

PROSPECTING FOR GRAVEL.—Prospecting on the Washington ridge promises to be very lively the coming year. Of course all the companies will not strike it. Prospecting is a gamble, but if two or three mines are struck it will more than compensate for the outlay that will be made hunting for others that failed.

IDAHO.—The new ledge in the Idaho shaft is 18 inches in width and shows gold freely, and is "holding its own." Milling tests have been very satisfactory.

NEVADA CITY MINE.—*Transcript*, Nov. 15: Superintendent Shoecraft is proceeding finely with developments at the Nevada City mine. Twenty-four men are working on tribute and wages. At the 300-foot level two crosscuts are being run, one for the overhanging ledge and one for the footwall. A rich ore body is liable to be encountered at any time. The work of remodeling the mill is going along well. Wood's Ravine is a very lively camp now, and promises to be still more so.

RICH ROCK.—The rock from the Cement hill ledge owned by Geo. Fletcher and John Skewes paid $20 per ton in gold instead of $13, as published by a contemporary. The sulphurets are very rich.

Shasta.

IRON ORE.—*Courier*, Nov. 15: Recently the owners of Iron Mountain mine sent to the San Francisco Iron Rolling Mills two carloads of iron ore from Iron Mountain, famed for its deep silver and gold deposits and the valuable working of the same. The two carloads were reduced by a process known to the establishment mentioned, and the result was the turning out of ingots of steel of the finest quality yet produced from any ore on the Pacific Coast. The superintendent of the San Francisco works, on seeing the result of the reduction alluded to, telegraphed to send down three additional carloads, and the ore is being hauled through town to the cars. It is among the strong probabilities that out of the hills and bowels of old Shasta county may yet come the material for the steel plates that will armor ships to carry the Stars and Stripes in dignity and security on every ocean and sea of the world.

PROMISING QUARTZ MINE.—The Eiler Brothers have a quartz mine on White Rock creek mountain, that ought to possess strong attractions to capitalists. The main ledge is three feet wide, and has been shafted 170 feet from surface and is as good at bottom as top. Tunnels tap it low down in several places, and upraises show the uniform quality of the ore, which goes from $18 to $30 per ton without sampling. Several ledges, showing good paying ore, run parallel to the main ledge. This mine is at such an elevation that there will be no trouble of working it by interference of water.

SOUTH FORK.—It is expected that work will soon be resumed at the Chicago, an expert having been up to report for a new company and he seemed well pleased with the outlook. A hoarding-house for the men is built at the Gem Mine. Robinson & Co. are getting some good ore from their Black Prince. They are also rebuilding their arastra to work some rich gold ore found on the South Chicago. Hubbard & Castle are building an arastra a short distance above the Chicago mill. They are going to run it on their Cold Spring ore. Shirland & Bro. are running their arastra on Atlantic and Little Giant ore. E. L. Ballou's arastra is running on ore from his Hope. Litten & Moody have their arastra completed and running on Continental ore. The Eubanks boys have their arastra about completed. At Muletown Doc. Dunham has his shaft down about 80 feet, and intends to drift at 100. He is getting some fine ore. Whit George is also getting some fine ore from the drift on his ledge. There is sufficient water for power, and the quartz-miners wouldn't object if this fine weather lasted all winter.

Sierra.

STARTED UP.—*Mountain Messenger*, Nov. 15: The machinery of the Mountain mine near Sierra City, owned by an English company and managed by George W. Pinnie, was started Saturday. The 40-stamp mill and the cable tramway worked to perfection. Should the mine prove good, it will give a great impetus to other mining developments which have long lain dormant for want of capital.

Trinity.

EAST FORK.—*Journal*, Nov. 15: All the mines are running in full blast. The North Star Co. have started a new tunnel to tap the lode at a greater depth. The prospects are very flattering and no doubt as soon as tapped a large body of ore will be opened up. The Enterprise Co. have struck the ledge on the Lone Jack mine and are running levels north and south; the rock increases in richness with depth attained, and they have at present ore enough in sight to keep the mill busy for a long time to come. The Lone Jack is supposed to be an extension to the North Star lode, and if so, it proves the North Star to be a valuable piece of mining property outside of its old discovered lodes. The Yellowstone is running a full crew and report says on very rich rock and every indication of plenty of it.

NEVADA.

Humboldt District.

THE GYPSUM BEDS. — *Silver State*, Nov. 15: The owners of the gypsum deposit east of town have commenced operations and are building roads and opening the mine. A contract to haul 1000 tons of gypsum to the station has been let to George Ladd. This deposit is reputed to be the best and largest in the United States.

LOOKING AT NICKEL MINES. — Lieutenant Buckingham of the United States Navy was here a short time ago in behalf of Uncle Sam, looking at nickel mines in this vicinity. Some very fine mines of this metal are located near here. One belonging to Mr. Bell at Cottonwood and one to Mr. Lovelock at the same place, were examined by the officer. It is hoped that Uncle Sam will find what he is looking after in this vicinity, as I believe there is an appropriation of a quarter million dollars by the Government to invest in nickel to be used in the armament of vessels, and if that much or a portion of it was used in this county for the purpose named it would make times lively. John O'Kane and John Ryan have a fine nickel prospect a short distance east of town.

SILVER MINES.—Col. Cessna of Ohio has bonded of A. Scidmore the Arahia mines, formerly the property of George Lovelock. The Morning Star mine in Trinity district is being worked by a force of eight or ten men. The mill has been moved from Oreana up in the canyon near the mine and is now about ready to start up.

LONG RUN.—The Spring Valley mill has just completed a long and, as near as can be ascertained, a successful run. The mills are now shut down for a short time. The best ledge of ore in the State is reported to be in this mine, which is owned by the Humboldt M. & M. Co.

Washoe District.

WEEKLY BULLION YIELD.—*Territorial Enterprise*, Nov. 16: The following table is arranged from the weekly reports of the mining superintendents and represents the number of tons of ore crushed the past week, value per ton according to battery samples, and totals:

Mine.	Tons.	Value.	Total.
Con. Cal. & Va.	1,575	$17.41	$27,420
Alta	315	18 00*	5,670
Yellow Jacket	540	18.00*	9 828
Crown Point	391	14.91	5 829
Overman	329	21.18	6,968
Savage	835	20.46	17,054
Chollar	533	19.24	10 254
Belcher	271	18.75	5,081
Occidental	295	20.10	5,929
Totals	5,090		$84,033

*Estimated. The report of the work of the Justice not at hand for the past week. It would add nearly $5000 to the result.

CON. CAL. & VA.—1200 level: Continue the extraction of some milling ore along the line of the north drift. 1300 level: Ore of a fair quality is still being extracted from the junction with the upraise. 1500 level: Extracting some ore in drifting northeasterly from the junction with the upraise 260 feet north from the Con. Va. shaft. 1600 level: Have continued to extract ore along and above the line of drift run east through the old stopes on the sill floor of this level. We are also working southerly from this drift stoping out ore. 1650 level: From the various openings we continue the extraction of ore of the usual quality and quantity. 1750 level: The southwest drift from the main west drift has been extended to 277 feet, showing quartz of low assay value. There has been extracted during the week from all parts of the mine 1611 tons of ore, which was shipped to the Eureka mill.

OPHIR.—West drift, 1300 level, is extended 25 feet in low-grade quartz; total length, 76 feet.

SIERRA NEVADA.—The southwest drift started on the 630 level has been advanced 41 feet in a soft porphyry formation, showing some seepage of water.

UNION CON.—East crosscut No. 2 from the north lateral drift, 1465 level, extended 27 feet, total, 237 feet; continuing in soft porphyry formation.

MEXICAN.—On the 1465 level an east crosscut No. 1 has been started and advanced 18 feet in a soft porphyry formation.

UTAH.—725 level: The main south drift has been extended 16 feet; total length, 783 feet. Formation, soft porphyry showing some clay.

Blind Mountain District.

MIDNIGHT CLAIM.—Pioche *Record*, Nov. 13: Jimmy Clark came in from Blind Mountain district last Thursday to stay a few days. He and Freddie Burrows are the only persons living in the district. They are working on the Midnight claim, and have been for nearly two years past. They have recently finished a 300-foot tunnel, which taps the working shaft on the Midnight and greatly facilitates the working of the claim. The ore veins so far found in the district are small, but very rich, and the Midnight is one of the most promising claims there and the general belief of those who know it is that it will eventually develop into a rich mine. About four tons of rich ore were lately shipped from the old Buckeye mine, near Ophir canyon, Smoky valley, to the West Sampling Works.

Cortez District.

A SATISFACTORY TEST.—Reese River *Reveille*, Nov. 14: The test which was made on ore from the Cortez mines with the O'Hara furnace at Mill City has proved satisfactory, the chloridizations working up to 93 per cent. The Cortez company have decided to erect one of these furnaces at their mines in Lander county.

FOR CHERRY CREEK.—Three big freight teams left Nelson's ranch near Stone House a few days ago, loaded with barley and a supply of hay for Hamilton, White Pine county, where they load the machinery for a 12-stamp mill to remove it to Cherry Creek, 90 miles south of Wells. The *Central Nevadan* says the Nelson Bros., of Stone House, are interested with a gentleman named Ellsworth in the Cherry Creek mines, which, until lately, have been in litigation. There is enough ore on the dumps of a high grade, it is stated, to justify the expenditure of $50,000. Ten thousand dollars have been expended in the last two years in lawsuits over the property. Four trips of these large teams will be necessary to transfer the mill to the plant, which will not be accomplished until the first of the year.

Campbell District.

CLIPPER HILL.—*Territorial Enterprise*, Nov. 15: Richard Streahley is reported to have a fine body of ore in his mine on Clipper hill, Campbell district. The claim is valued at $25,000. The Cortez Mining Co. has taken charge of the Clipper and is intending to soon put a force of men to work. The mines in Morey are looking well and good silver ore is being hoisted to the surface constantly. The Morning Star mine, Pittsburg, Lander county, has closed for the winter. Next spring the company will begin the extraction of ore and the building of a mill in Lewis canyon.

THE HOLMES MINE.—Walker Lake *Bulletin*, Nov. 12: For the week ending November 1, the Holmes mine at Candelaria had 228 tons of ore milled at the Belleville mill. Average assay value of the battery samples, $30.92 per ton. The superintendent writes: "We are taking out some ore from the Creole ledge on the east side of Pick Handle gulch, which assays 29 ounces of silver per ton." This new strike is very near the old Belding ground.

Candelaria District.

MT. DIABLO.—Walker Lake *Bulletin*, Nov. 15: The mine was shut down Tuesday on account of the State election and was not started up for two or three days, as we had some repairs to make to the engine. There is no special change to report from the mine during the week. On the sixth level the east drift gives a small amount of $50 ore. The main stope between the fifth and sixth levels shows three feet of $40 ore. The north crosscut from the east drift on the fifth level shows 18 inches of $60 ore in the upraise, and a small amount of $40 rock comes from the west drift, same level. The west intermediate between the first and second levels is giving a small amount of $40 ore. The west drift in the Mt. Diablo adit shows small bunches of $30 ore in the face. The mill has been running steadily during the week and doing good work.

HOLMES.—Have resumed the extraction of ore in all the levels down to the new twelfth, averaging from $29 to $55 per ton. Will commence stoping on the ore body cut in the Sutherland tunnel during the week. In the old Creole tunnel we are taking out some ore from this section of the mine assaying about $30 per ton. We are working 8t men and taking out about 55 tons of ore per day. No ore crushed at either mill during the week. Candelaria mill now crushing Holmes ore, with fair prospect of a good month's run. Bullion shipped, about 7000 ounces.

ARIZONA.

NOTES.—Prescott *Courier*, Nov. 15: Turkey Creek miners have considerable rich ore to ship. Owners of the Zero, a Hassayampa mine, are taking out rich ore. Cherry Creek miners are doing well with arastras. The Boggs and Hackberry mines, in Big Bug district, have produced great piles of ore, which will soon be worked. The new Senator mill will soon be ready for work. United Verde is shipping carloads of copper-silver hullion. Tip Top miners continue to get good results from ore shipped to El Paso. Del Pasco mill was to have started on another run Monday last. S. C. Mott has 50 or 60 men employed at his mines and mill. He will make another large shipment of silver in a few days.

GRAHAM COUNTY.—Tucson *Star*, Nov. 15: Joseph Smith, who owns some mining property in Aravaipa canyon, Graham county, arrived in this city this morning and reports matters there in a prosperous condition. The ore produced by the mines there is galena and silver and assays about 40 per cent lead and about 82 ounces silver. The New York Company are operating 32 prospects, most of which show well-defined ledges or true fissure leads.

FIRE.—*Arizona Silver Belt*, Nov. 15: A fire occurred at the Old Dominion Copper Co.'s works Sunday morning, Nov. 2d, at half-past 3 o'clock, which for a short time threatened the destruction of the hoisting works. The chief loss to the company was the tools destroyed. No interruption of mining will be caused.

HACKBERRY PROGRESS.—Prescott *Courier*, Nov. 8: Mr. J. J. Williams, superintendent of the Boggs, Hackberry and other mines, is having a narrow-gauge railroad constructed from mine to mine. It will run by the smelter, which is to be on Big Bug creek.

RESIGNED.—J. F. Blandy, Territorial Geologist, has resigned his position. He cannot afford to give the necessary time to the duties of that office for the small salary of $1500 per year.

KINGMAN DISTRICT.—*Mohave Co. Miner*, Nov. 8: Mr. W. A. Farish has 12 men at work on the Union mine taking out good ore and shipping to El Paso; he will put a few more miners to work this week. Work on the Phœnix mine is progressing favorably and the mill is running steadily on good ore.

BRITISH COLUMBIA.

GENERAL MINING NEWS.—Nelson *Miner*, Nov. 12: Now that snow covers the mountains, making it impossible for the prospector to follow his calling with any degree of comfort or profit, many who follow that pursuit are coming in in search of employment for the winter. Neither the camp at Ainsworth nor the one at Nelson has reached the stage of development requiring a large number of men to carry on the work. Less than 100 men are now employed at mining in the two camps, and the number is not likely to be increased during the winter. Prospectors who are practical miners, therefore, stand but a poor show of obtaining employment at their trade in the lake country. While they can put in the winter as cheaply in either Ainsworth or Nelson, as far as actual living expenses go, as in any of the towns in mining districts in Montana or Idaho, but few of them have the means to do so. They are men who work in the winter to earn money to defray their expenses while prospecting in the summer. In Toad Mountain district everything, in a measure, depended on the Hall mines. It was hoped that they would give employment to at least 100 miners during the winter. But these hopes will not be realized. This setback is due entirely to a gang of ringsters at Victoria jumping the property—a gang who do all their prospecting for mineral in the offices of mining recorders. While their chances are slim for obtaining possession of the Silver King and Kootenay Bonanza, their dirty work has prevented the original locators and owners of the mine from taking any progressive steps toward the development of the property. At present three shifts are at work on the Silver King tunnel, which is in nearly 300 feet. About 150 feet are still to be run, and the work is progressing at the rate of 12 to 13 feet a week. On the Dandy a shaft is being sunk; but water is said to interfere with the work. On Eagle and 49 creeks some little work is being done by owners of claims. A 2-ton sample shipment of ore from the Whitewater, a Rover creek claim, was made to the Revelstoke smelter during the week.

COLORADO.

EAGLE COUNTY.—Denver *M. & S. Review*, Nov. 15: Some specimens of very rich ore were brought in this week from the Kentuck Boy, on Taylor hill. The ore is a hard carbonate coming from a fissure in the lime; it is heavily impregnated with gold, and the surface of the ore shows free gold in large quantities.

CLEAR CREEK COUNTY.—Over in the Lamartine district everything is life and activity. The Lamartine, Pulitzer, St. Louis and Harrison are all working good forces of men, and an immense amount of ore is being taken out. Lamartine is bound to be one of the best camps in the county.

LAKE CITY'S FUTURE.—Hinsdale *Phonograph*, Nov. 15: With silver and lead at fair prices in 1892, Lake City will be the heaviest shipping camp in Colorado, and the most prospernus mining camp in America. Mark the assertioo. An important strike was made on the Paris the fore part nf the week. In driving the 5th level a large chamber or cave was opened up that extended downward to an unexplored depth. The chamber contains hundreds of tons of excellent ore for over 30 feet in width. Mr. Pray informs us that in two weeks he expects to double the present facilities of hauling and will sbip two cars per day instead of one.

SAN JUAN COUNTY.—Silverton *Miner*, Nov. 15: The most important mining item of the week has been the big strike on the 2d level of the Congress mine. We are informed that the ore body has been exposed for a distance of 20 feet long and 8 feet in width, and there is no sign of a wall on either hand. The ore is black copper and there is not 15 per cent waste in the entire mass.

IDAHO.

GOOD ORE.—*World*, Nov. 11: The Washington Co. made a cleanup the other day. The ore went $22 per ton, and was not assorted. The ledge ran seven feet in width, and was allput through the mill.

NEW MILL.—The most of the machinery for the Ciunabar Mining Co.'s new 10-stamp mill was delivered in Clayton, Fridav, by one of H. C. Lewis' large freighting outfits. Mr. J. Phillippi will take it from here to the mine. He started with a load Saturday.

WAR EAGLE MOUNTAIN.—*Avalanche*, Nov. 8: Robert Sothern, owner of the Dernier Resort claim on War Eagle mountain, has struck a fine body of ore in the tunnel he has been running on the vein. The tunnel is in some 300 feet and has been for a long distance in ore prospecting about $20 a ton, but has now reached a chimney, which parties who have seen it report to be "away up." The ledge is four feet wide with well-defined walls. The Chautauqua mine, one of the Lepley group at Wagontown, is showing good ore in both the north and south drifts, the pay streak heing about 15 inches wide in eacb place. The main crosscut tunnel now being driven by Wells, Barker & Co., is expected to soon cut a ledge. It is in hard rock and is working the boys pretty bard. Steve McElmeel and Gilbert Mickelson have cleaned out the tunnel on their mine on War Eagle mountain, built a new house, and laid in a supply of grub for a winter's campaign. Al. Stevens will soon sink a shaft on a newly acquired claim on Lewis' Gulcb, with excellent prospects of making the mine a productive one. The prospects of the Bshy mine bave materially improved during tbe week, and a large output is confidently looked for in the future. The Injector, owned by Geo. W. Stoddard, is showing up well as development work progresses.

MEXICO.

COAL FIELDS.—*Star*, Oct. 20: A promising coal strike has been made at San Marcial in the State of Sonora, Mexico. Lately the diamond drill while at work on the extensive grant of the Mexican Coal Co., at the depth of 80 teet struck a vein of antbracite coal. The auger had penetrated six feet, when some of the diamonds became loose and drilling was stopped without having passed through tbe seam. The seekers after coal had foolisbly kept following tbe broken remnants of the coal measures in the wild volcanic regions of La Barranca, San Xavier and Tarumary, where Alsua & Graff had made discoveries. In 1881 Mr. J. M. Ainsa visited the country and he saw with a calculating eye, after examining tbe formations at the Alsua & Graff mines and the ground from there west to San Marcial, that tbe whole country for 70 miles square was once one vast coal deposit that volcanic eruptions had broken up, as shown by the mountain ranges that cross the country at intervals, and be rectified his tbeories by the outcroppings of coal found about the base of every mountain range in that locality. The Topeka engineers, including Mr. Gardiner, bave examined these fields and pronounced them worthless; other scientific men who came were puzzled by the formations and declared they did not know wbat to say; they bad never seen the like in tbeir life nor read about it. In tbe midst of their many disappointments tbe Anisas and Garcias still kept up their belief undiminisbed, and for a last result they levied an assessment and started to bore and show to the great coal sharps of the United States and Europe that their theories were at fault. They bored and have struck under the valley the true carboniferous coal measures. On the surface, at a place called La Penitas, the coal measures are thrown up and spread like a map upon the ground and there appear 37 coal seams varying from one foot to 14 feet in thickness. It is not long but the diamond drill will demonstrate whether these veins are to be found at the bottom of the San Marcial valley, and if sucb turns out to be the fact Sonora will have the honor of containing in its bosom tbe greatest coal deposits in tbe world.

MONTANA.

BUTTE ITEMS.—*Inter-Mountain*, Nov. 15: Success seems to attend every effort of tbe Butte & Boston Co., and tbe mere fact of their baving purchased a property seems to be sufficient to have it turn out a bonanza. The new concentrator that is being built by this company is so near completion tbat the machinery is being tested daily. When completed this concentrator will have a daily capacity of 400 tons and will be the largest of its kind in the camp. It will be a great addition to the producing power of tbe Butte & Boston and to that of the camp as well.

A GOOD SHOWING.—There has evidently been no falling off in the prosperity of the Drumlummon mine during the past month. The official report of the Montana Co. shows the net profits of that property during that time have been 531,600, which is not a bad showing on a total output of $87,000. The official figures are as follows: The 50-stamp mill crushed 3800 tons worth $47,700; the 10-stamp mill crushed 583 tons worth $20,700; the 60-stamp mill crushed 2900 tons worth $18,000. This makes a total of 7273 tons of ore treated, turning out $87,000 in cash. The working expenses for the same time were $55,400, leaving a profit of $31,600 to the credit of the company.

OTHER MINES.—The Quilp mine has reached the 200 and sinking continues to the 300. A. A. McDonald and others, who recently purchased the Jersey Blue, are about to locate a new shaft and commence work upon it. Leggat and Palmer, who recently purchased the Sullivan mines at the head of Boulder, about one mile north of Granite, are sending in men and supplies to commence work on that group.

NEW MEXICO.

RICH MINES ON THE NAVAJO RESERVATION.—*Southwest Sentinel*, Nov. 11: Cen. E. A. Carr, who has been on a hunting expedition, returned on Friday. He visited the Carrizo mountains, and good authority says tbat he found plenty of rich ore—in fact, some of the richest ever found in North America—and that he will recommend that that portion of the Navajo Indian reservation be thrown open to the public.

ACTIVE WORK IN PROSPECT.—Rio Grande *Republican*, Nov. 15: Prof. Carrera has acquired an interest in the Huston & Thomas lead mines on the western slope of Pinos Altos mountains. The professor has started work on the claims, and within ten days will have 15 or 20 teams bauling ore to the railroad at tbis place. The ore vein crops out for a distance of over 300 feet and shows an ore body of 14 feet in thickness. It is one of the largest ore chutes ever found in the West showing such a large body of ore on the surface. At tbe present prices of lead and silver, it will surely return large profits. These mines are named the Alpha and the Omega.

OREGON.

BIG DITCH.—*Union*, Nov. 15: Tbis ditcb, 27 miles of which will be completed in a few days, will be an average of five feet at tbe top, three feet at tbe bottom and two feet deep. The water will be taken out of the East Umpqua river and led over Myrtle creek. The compauy bas ordered 200 feet of 15-inch hydraulic pipe and two giants of 1000 pounds each. Tbey propose to work the mines this winter with both giants. Tbey have now 50 men employed in the construction of tbe ditcb, and it is expected to begin mining by Christmas. These mines have been worked for years, but owing to a lack of water tbey have not been as profitable to the owners as desired, thougb they bave paid wages. When they get a sufficient amount of water, wbich tbis ditch will furnish, tbese mines will doubtless pay richly for tbe increased cost of working. The gold is in the ground beyond a doubt, and when they are worked by the bydraulic process, can't fail to pay large dividends. The company bas not gone blindly to work in tbis matter as a prospecting venture. Tbey have thouroughly prospected the ground and find tbat the auriferous deposits are extensive and of a bigb grade. The company of which Dr. L. W. Brown of Eugene is president, is organized witb a capital of 25,000 sbares, at $25 a share, par value, quite a large amount baving already been taken. Louis Catching, an old miner in tbat section, has tbe coutract for the work on the ditch, and his claim, from wbich, in a primitive manner, $900 was cleared up in nine weeks' run, has been purchased by tbe company. The company now controls 2080 acres, most of wbicb will do to mine and cannot be worked out for years to come. If the diggings are anywbere near as rich as the prospects indicate, or as tbe ground already worked bas been, it will be a bonanza to the fortunate owners.

TO PROSPECT BLUE GRAVEL.—Ashland *Tidings*, Nov. 14: Last year eight Ashland men located claims in the blue gravel region, near Henley, Cal. Tbey associated tbemselves together under the name of the El Dorado Blue Gravel M. Co., and did some prospecting last fall. Tbe first point to be determined was to ascertain wbether tbe blue gravel deposit actually underlies their claims. To get at this at a minimum cost, a contract was given to Dodge & Williams to drill a well to tbe depth of 200 feet or less. Tbe work was begun, but owing to difficulties in operating tbe drills, tbe bole was not sunk to the depth desired. Tbe company now purposes to begin prospecting work again, and concluded a few days ago to admit some other men to an interest in the venture. For tbat purpose a prospecting copartnership is to be formed and sbares disposed of to those wbo want tbem, up to a certain amount. The number of shares is placed at 150, par value $20, and the purcbase of one share gives the purcbaser a 150th interest in tbe property. It is the purpose of the company to first determine that the claims cover the blue gravel, and in so doing, if the result be favorable, to then incorporate and begin prospecting for what the blue gravel is supposed to contain. Wednesday morning a committee of the company, Messrs. Roper, Burriss and Phillips, went over to Henley to look over the ground and report upon tbe best method of prospecting. They intended to visit all tbe mines that have been opened on the blue gravel lead, and will probably return home this evening.

PUTTING IN SMELTERS. — Union *Republican*, Nov. 12: The Oregon G. M. Co. of Cornucopia has at last got down to business. Their large 20-stamp mill is kept running night and day. For several days teams have been hauling brick from this city to be used in erecting smelters at Cornucopia for this company. The result of the work is beginning to be seen. A party came down yesterday and deposited a large amount of bullion in the First National Bank.

RICH SILVER ORE.—*Statesman*, Nov. 13: The best silver ore ever brought to Walla Walla is that recently received by J. C. Swash from a ledge he and other Walla Walla men are interested in over in Baker county. In silver, some of the samples are equal to any tbat ever came out of the Comstock. It is black sulphuret ore containing ruby, brittle and antimonial silver, witb indications of cbloride, The ore is very lively looking and has every appearance of coming from a good solid ledge, whicb is said to be fully four feet wide. The specimens shown us came from a depth of 80 feet. We hope it will turn out a bonanza for all the owners, and that they will show their enterprise in Walla Walla by erecting a fine hotel a la Tabor when they make a few big cleanups.

SAMPLING WORKS.—A reduction plant, such as is proposed by the Baker City Oil Concentration & Sampling works, cannot help but be a great benefit in the development of the mining resources of Baker, Union and Grant counties. It will give the mine-owner a ready sale for his ore at the company's works and enable him to place his property in a shape for remunerative disposal if he so chooses.

SOUTH DAKOTA.

CALEDONIA GOLD M. CO.—Deadwood *Pioneer*, Nov. 14: There are three direct vertical fissure veins exposed in the workings of this mine. Ore is blasted out in the stope in large enough quantities at one blast to run the mill for months at a time. At present, holes are drilled in one of the pillars that will admit of a charge of 1000 pounds of powder. This will be sbot off in a short time by means of a battery attachment. Past experience demonstrates that tbis can be done with perfect safety to the workings. To see this mine lighted up on each level is indeed a sight to be long remembered. Tue Caledonia is located on the same belt as the Homestake and Golden Terra, and while the ore averages about the same value, yet it is so much harder in character that nearly a ton a day less to the stamp is crushed. The mill is of 100-stamp capacity.

D. & D. SMELTER.—Dr. Carpenter left yesterday morning for Chicago to purchase machinery for the new D. & D. smelter. The smelter will cost, when completed, $800,000, at least half of which will be spent in Deadwood.

UTAH.

CENTENNIAL-EUREKA.—Eureka *Chief*, Nov. 15: Tbe richest ore body in the Centennial-Eureka—that on the 300-foot level—is now 18 feet wide and constantly growing wider. On account of the richness of this ore and the fact that their storehouses are all full of ore, no more will be shipped until silver advances. Tbe Centennial-Eureka is one of the greatest properties in Utah.

PARK ITEMS.—*Tribune*, Nov. 3: The Crescent Mining Co. shipped during the past week 400,000 pounds of concentrates. The upper tunnel of the Glencoe mine is looking fine, and the ore body continues to increase as developments are being made. Receipts at McIntosh sampler for week ending November 1st: 670,150 pounds of Ontario ore, 113,730 pounds of Anchor ore, 32,070 pounds of Daly ore, 20,700 pounds of Woodside ore, 283,060 pounds of Anchor concentrates, 34,450 pounds of Mayflower jiggings.

PARK DISTRICT.—*Stock Exchange Journal*, Nov. 15: Preparations are being made for a good winter's work in the mines in the Park. Supplies are being stored, wood hauled and everything made comfortable in and around tbe works. The output from tbe Park City mines next year will astonish the natives.

NOTES.—Park *Record*, Nov. 15: Tbe Apex will make a big shipment of ore as soon as the roads permit hauling by sleds. Ontario stock has declined to $38.50 per share, on account of the bear movement in New York. Work will be resumed shortly on the Montreal group, in Lower Snake creek. The tunnel is in nearly 400 feet and will be driven 200 feet farther. The leasers of tbe Roaring Lion are piling up a big lot of bigh-grade ore for sbipment as soon as enough snow falls to enable sledding down Thayne's canyon to the sampler. Tbe incline upraise from the Anchor tunnel to connect with the drain-hole in the shaft is progressing favorably. The mine is in splendid condition, and tbe output of high-grade and concentrating ore is increasing in volume. A few days ago Messrs. Gitsch & Macdonald encountered an eight-inch vein of galena ore between solid walls at a point 218 feet in their new tunnel in the Silver Key group, just west of the Apex.

WASHINGTON.

VARIOUS ITEMS.—Sultan City *Journal*, Nov. 15: All the mines in the Kootenai country are turning out good ore, going as high as $400 to the ton. One hundred tons of coal per day are taken from the South Prairie mines, and find a market in Tacoma. The 30-foot tunnel on the Ranger, belonging to the Wilman Bros., discloses tbe finest and richest grade of galena found in the State. The mineral wealth of the Upper Skagit country—its iron, coal and precious metals—is considered by those who are competent to judge as the richest and most extensive yet discovered in tbe West. The recent discoveries of rich coal mines at a point some 22 miles from Port Townsend has led to the organization of a $100,000 stock compaoy to develop the mines, which are said to be also rich in copper and silver.

LEAD AND SILVER IN THE CASCADE RANGE.—Sultan City *Journal*, Oct. 25: Mr. Wallace was in Sedro the otoer evening on his return from Seattle, where he has just bad assays made on some mineral be recently located near the head of Sauk river. Tbe ore run over 90 ounces of silver and upward of 65 per cent of lead, the assay demonstrating the value of the ore to be $173 per ton. Though it is getting late in the season, Mr. Wallace expects to again visit tbese choice locations before winter closes in to bar people out of the Cascades for the season.

Complimentary Samples.

Persona receiving this paper marked are requested to examine its contents, terms of snbscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its valne more widely known to others, and extending its influence in tbe cause it faithfully serves. Snbscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordersd soon enongh. If already a snbscriber, please show the paper to others.

THE London society of compositors has decided in favor of eight hours.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitore for Pacific Coast.

FOR WEEK ENDING NOV. 11, 1890.

440,257.—PRESERVATIVE—Benussi & Dondero, S. F.

440,348.—PRINTER'S GALLEY—W. C. Dillingham, Los Angeles, Cal.

448,223.—CARPET-CLEANING MACHINE—Wm. Fay, Oakland, Cal.

440,353.—WATER-WHEEL—W. H. Gunsolus, Sutter Creek, Cal.

440,565.—UPSETTING MACHINE—Silas Harris, S. F.

440,252.—PUMP—B. Jackson, S. F.

440,599.—PICTURE-FRAME HANGER—W. C. Keithly, S. F.

440,177.—GATE—Middlekauff & Harsin, Stockton, Cal.

440,443.—SELF-CLOSING GAS-BURNER—W. W. Sherman, S. F.

440,283.—SLIDING GATE—G. F. Sherwood, Salem, Or.

440,337.—SICKLE GRINDER—H. Thibault, S. F.

440,212.—GLOBE AND LAMP SHADE—O. F. Wegener, Seattle, Wash.

The following brief list by telegraph, for Nov. 18, will appear more complete on receipt of mail advices:

California.—Eugene S. Bonnelli, San Francisco, exercising device for musicians; Albert E. Braker, Ventura, drop regulating attachment for seed-planters; Rickwell S. Chaplan, San Francisco, hose reel; Arthur W. Coffin, San Francisco, ticket-punchor; Albert A. Dickie, Suisun, nut lock; Thomas E. Evans, San Francisco, machine for cleaning and polishing knives; George W. Haines, Stockton, traveling thrasher and cleaner; Henry O. Harper, San Francisco, lock; Henry Knight, South Riverside, universal steam joint; Joseph Korbel, San Francisco, guard for gang-edgers; John T. McLean, Santa Cruz, device for securing extra leaves in books; Demirij Medeleff, San Francisco, explosive; Anson L. Munson, Oakland, treating coal tar; George Rischmuller, San Francisco, safeguard for cable and horse-cars; James Rowe, San Francisco, composition for protecting piles; Philip Somerville, San Francisco, railway cable crossing; Charles W. Thompson, Tomales, automatic wagon gate; Sydney B. White, Los Angeles, stamp-cancelling and dating machine; James F. Wickham, San Francisco, stencil-cutter.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SICKLE GRINDER.—Henry Thibault, San Francisco, Cal. No. 440,337. Dated Nov. 11, 1890. This machine consists of a support for the sickle, a means for fixing said support upon one of the wheels of the mowing or reaping machine, an adjustable standard, with a grinding disk mounted upon a sbaft thereon, and means for adjusting said disk to the teeth of the sickle and for rotating the disk to grind the teeth.

WATER-WHEEL.—William H. Gunsolus, Sutter Creek, Cal. No. 440,353. Dated Nov. 11, 1890. This wheel is of the "hurdy-gurdy" type. The novelty rests in tbe bucket, which is made heart-shaped, each bucket having a divisional rib formed by the rim of the wheel plate or disk extending from the back of one bucket into the wide end of an adjacent bucket. The object is to receive tbe impact of the water to the best advantage and to discharge it equally on each side, avoiding splashing and consequent interference of the discharging water with succeeding buckets.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Modoc and Lassen Cos.
T. B. LESIEUR—Humboldt Co.
GEO. WILSON—Sacramento Co.
J. P. QUINETTE—San Francisco.
J. C. HOAG—San Francisco.
SAMUEL CLIFF—Creston, Cal.
W. W. THEOBALDS—Kern and Tulare Cos.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
W. B. FROST—Marin and Sonoma Cos.
GEORGE EVANS—Santa Clara Co.
MRS. M. E. DUDLEY—Ventura Co.
ANDREW REID—Monterey Co.
B F. BELT—Shasta Co.
FRANK S. CHAPIN—Colusa Co.
WM. M. HILLEARY—Oregon.
HENRY STACEY—Oregon.
WM. HOLDER—Oregon.
R. G. HUSTON—Montana.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

Attention, Southern California Miners.

WORKS FOR SALE.

The Works are situated at Daggett, Cal., in the Calico Mining District, and on the side-track of tbe Atlantic and Pacific Railroad. They contain a first-class 50-horse power engine and 45-horse power boiler, with Ore Crusher and other machinery, Mill Scales, Assaying Outfit, etc., all nearly new. Also upon the premises an office building and a comfortable dwelling-house (portable). The above can be had at a bargain. Apply to W. M. SMITH, 526 Jones St., San Francisco.

MECHANICAL PROGRESS

Progress in Metallurgy.

We are apparently on the eve of some important discoveries in the metallurgy and physical properties of iron, steel and other metals, says the *Engineering and Mining Journal*. In Howe's work on the "Metallurgy of Steel," some account is given of the recent developments in alloying steel by means of the new electrical process. A whole field of investigation is opening as to what uses can be made of the metal and as to what properties it has when alloyed with other metals. The time seems to be ripe for a most extended and scientific investigation, upon a large scale, of the properties of the whole series of commercial metals and their alloys. We are just finding out how dense has been our ignorance up to recent times concerning them. As an instance, ever since pig iron was made, a few hundred years ago, up to almost the present time, it has been considered that certain brands or grades possessed peculiar valuable properties, and that certain other branches and grades were inferior. Chemical analysis, after years of unsystematic and tentative experiment, gradually revealed that the variations in properties had something to do with chemical constitution; but it is only recently that it has been experimentally shown, what might have been foreseen, that a mixture of two different kinds of inferior iron, such as silver-gray and white iron or remelted scrap, in certain proportions, definitely determined by analysis, could produce a superior grade of iron, approximating to the best charcoal. Millions of dollars might have been saved if this fact had been known to founders during the past half century.

Experimental research on the metals has been carried on in the tentative method, here a little and there a little. An isolated fact has been discovered now and then and perhaps published, but its bearing upon other facts has been lost sight of till some other discovery, made years afterward in another part of the world, might throw light upon it and lead still further. Heath put manganese in steel in 1845. Bessemer decarburized iron by air in 1856, but left out manganese, and his metal was red short. Mushet discovered that what Heath did, would improve Bessemer's metal. Siemens later invented the regenerative furnace, which was all that Heath lacked to make open-hearth steel, but he also left out manganese, and it was left till some time later for Martin, in France, to add together what Heath and Musbet and Siemens had done, and make open-hearth steel; and yet other years passed by before it was known that boiler plate must be low in both phosphorus and carbon to be of first quality. The introduction of steel boiler plate was delayed for years on account of the ignorance of the fact.

Growth of the American Iron and Steel Interests.

The present importance and high relative rank of the American iron and steel interests, together with the great assistance a protective policy has given to their development, are admirably illustrated in a brief article giving a synopsis of leading incidents in the history of the American iron industry, published in the Bulletin of the Iron and Steel Association and a compendium of statistics relating to this subject contained in a neat pamphlet issued by that association. It is hard to realize that the American product of pig iron has grown from 60 377 net tons in 1810 to 323,331 tons in 1840, 919,770 tons in 1860, 4,295,414 tons in 1880, and 8,516,079 tons in 1889. The development of all steel-making industries has proceeded with corresponding rapidity from 30,000 tons in 1868 to 819,814 tons in 1878, and 3,792,020 tons in 1889. As a result of this rapid growth, the United States closely approached Great Britain in 1889 in magnitude of product of pig iron and steel, and made last year 30 per cent of the pig-iron product of the world, and 31.5 per cent of the world's product of steel.

Of the influence of a protective policy in promoting this extraordinary advance and its bearing on railway construction, the Bulletin forcibly says: "The stimulating effect upon our iron and steel industries of the protective policy which was firmly established since 1861 has been marvelous. The world has never known such wonderful progress in any of its leading industries as has been exhibited from 1861 to 1890 in the growth of our iron and steel industries. To-day we are the leading pig-iron producing country in the world, distancing our great competitor and our persistent industrial rival, Great Britain, in the production of this essential aid to modern civilization. The census statistics of 1890 establish this fact. We have for many years produced more Bessemer steel and more Bessemer steel rails than Great Britain or any other country. We have more miles of railroad than the whole of Europe. We could not have had this vast railroad mileage if we had not been able to produce Bessemer steel rails in large quantities and at low prices."

CHARACTERISTICS OF SUPERIOR BELTING.—A London journal says that to test the quality of belting, a sure method is to take a piece, say 8x2 inches, and cut it down four inches into two strips, each one inch wide, and submit the leather to a tearing strain; if of the best grade with respect to quality of hide and quality of tanning and currying, it will have great power of resistance, but if torn, then most of the fibers will not pull out, but will break, because they are thoroughly united to each other by gummy oil; and if, in the tearing strain, the fibers pull out to a great extent, that is an indication of imperfect or incomplete currying, though the original quality of the tanned leather may have been good, for a poor piece of leather tears easily and a majority of the fibers break short off. A final and conclusive evidence consists in testing the fibers themselves, by seizing them with the fingers at the place of rupture and subjecting them to a breaking strain. In a piece of material which is of really poor quality the fibers have little strength, and this is easily perceptible.

SHAPING METALS BY ELECTRICITY.—Mr. Herman Lemp has patented a device for forming or shaping pieces of metal when rendered soft or plastic by an electric current. In carrying out the invention, it is proposed to use a transformer provided with a secondary of very low resistance, so as to produce a current of great heating volume. The terminals of the secondary are brought adjacent to each other and provided with clamps, one of which is arranged to slide to or from the other. The piece of metal to be operated upon is secured by the clamps at its ends, and the primary circuit of the transformer thrown into connection with an alternating current circuit. The bar of metal is soon heated to plasticity, when the sliding clamp is withdrawn, thus rupturing the metallic bar being operated upon. A die is then placed over the plastic ends of the bar, and the sliding clamp is forced inwardly so as to drive the heated ends of the bar against the face or faces of the die, thus producing a swaging action on the softened metal and causing the same to assume the form of the die. The advantages claimed for this invention are great expedition of manipulation.—*British Mail.*

NOVEL GERMAN INVENTION.—A Berlin inventor has devised an elevator which is said to be simple and inexpensive. It is described as follows: It is on the principle of an inclined railway, and the motive-power is furnished by water, which is applied in the cellar; each flight has its separate chair, so that, for example, one person can ascend from the first to the second story while another is on his way from the second to the third, or still another is descending from the fifth to the fourth. The chair, being only the width of the human body, requires but little space, and still leaves a free passage for any who wish to walk up or down instead of riding. It is set in motion by a simple pressure upon one of its arms, while after it has been used it slides back to the bottom step, its descent being regulated in such a manner that the carrying of a passenger is a matter of entire safety. The motive-power is, of course, more or less expensive, according to the cost of water.

"WOOTZ" is a peculiar quality of iron made from time immemorial by the natives of India. It is especially valued for edge tools. The *Times of India* writes in regard to it as follows: "It would certainly be worth while to take the question of producing 'wootz' on a large scale into consideration. If it paid a Persian trader to make periodical visits from Ispahan to Nirmal in the Subah Berar for the sole purpose of obtaining this iron for the Persian armorers, it would probably pay to export it to England. The iron is found in a very pure state in fine grains among a kind of mica schist. The treatment of the ore was local and peculiar; two qualities of iron obtained from magnetic iron sand and laterite respectively were blended in the steel crucibles. Very hard steel cakes, called by the natives 'wootz,' were thus produced, the heat to which they were subjected being exceptionally high."

FOREIGN IMITATION OF AMERICAN KNIVES.—The importation of foreign goods stamped as if manufactured in the United States ought to have been stopped long ago. Under the guise of home production, the country has been flooded with worthless articles which no reputable manufacturer here would attempt to compete with. A very fruitful commodity under this head has been the pocket-knife, bearing an American imprint of some nondescript company, but made of inferior materials in Germany or wherever the cost of labor is but a pittance. That our manufacturers engaged in this industry should have felt the injurious effects of such nefarious practices is not surprising, and we shall gladly hail the day when it will no longer be possible to perpetuate them.—*American Merchant.*

PRESSURE USED IN DRILLING CAST IRON.—Prof. Breckenridge of the University at Leigh has, according to *Le Genie Civil*, made several experiments for the sake of ascertaining the pressure required to drill through cast iron. A cylinder was filled with oil and provided with a pump piston 10 square inches in area, to which was attached the pressure of 181 kilograms, while for drills of $\frac{1}{2}$, $\frac{3}{4}$, 1 and $1\frac{1}{4}$ inches diameter, the corresponding pressures rose to 407, 498, 566 and 815 kilograms.

COMPOUND ARMOR TESTS at Amager, near Copenhagen, fully corroborate the results of the recent trial at Annapolis. The Cammell compound plates were found to be much inferior in resisting power to the Creusot steel plates. No nickel-steel plates were tested.

SCIENTIFIC PROGRESS.

The Human Body Forty Years Under Water.

A very interesting report has just been issued by Dr. Konig, judicial physician of Hermannstadt, on the state in which the human subject, after 40 years' immersion in water, may be found by the physiologist. In the revolutionary upheaval of 1849, a company of Honveds, having fallen in the vicissitudes of war, were consigned to the waters of the Echoschacht, a pool of considerable depth not far from Hermannstadt. After some 41 years their bodies have been brought up again to the light of day and subjected to a careful and minute investigation from the physiologist's point of view. Dr. Konig found them in perfect preservation, without a single trace of any decomposing process. Externally they had the appearance of having been kept in spirit, like so many preparations in an anatomical museum. The epidermis was of a whitish-gray color, the muscles rose-red, feeling to the touch like freshly slaughtered butcher's meat. All the inward parts—the lungs, the heart, the liver, the spleen, the kidneys, the bladder, the stomach, the alimentary canal—were of the consistence of those in a newly deceased corpse, while the brain was hard, of a dirty gray color, as if preserved in spirit. Structurally, the organs retained their outline perfectly, and were so easily recognizable in tissue as well as configuration that they might have been exhibited for "demonstration" in an anatomical lecture-room.

After 41 years under water, this is indeed a remarkable phenomenon. The large intestine contained fæces of a yellowish brown color, quite unaltered and quite inodorous, while the bladder was partially filled with straw-colored urine.

But perhaps the most significant feature disclosed by these corpses is the following: In their interior, abundant chloride of sodium crystallized in cubes, had been deposited and fixed on the several tissues and organs. These salts had not penetrated, mechanically, into the bodies from without, for on the outer surface of the heart itself, salt crystals of the same kind, to a weight of five grammes, were found adherent. This, according to Dr. Konig, clearly shows that, in the water, particles held in solution may pass through the skin and the muscles and find their way into the most deeply seated organs. Herein, he adds, we have confirmatory proof, if such were needed, that the specific virtues of mineral baths exercise in this way their salutary effect on the internal economy of the invalid bather. There is a notable difference, however, between the time spent in the bath by an ordinary bather and the 41 years during which the Honveds remained under water. The phenomenal stillness of the Echoschacht may also have been a material factor in this impregnation of the corpses with chloride of sodium. But, with every allowance for such considerations, Dr. Konig has furnished a striking illustration of the permeability of the immersed human subject to salts in solution, and we hope his painstaking researches will lead to others in the same important direction.—*The Lancet.*

Another Greenland Exploration.

Lieut. R. E. Peary of the United States Navy has a plan for completing the survey of Greenland that is different from any undertaken before, and he firmly believes in its feasibility, as he had the initiatory experience of a 200-mile walk over the ice cap of that far, mysterious land four years ago. The scheme he proposes is to sail as far up the west coast of Greenland as possible, and start thence on foot, walking near the edge of the ice cap until he reaches the farthest point north. Thence he can go down the eastern coast—if supplies and enthusiasm hold out—until he reaches Cape Bismarck, at the northmost limit of exploration on that side, as Cape Washington is on the other. From that point he can cut westward across the continent, as Nansen did recently, and reach his starting-place, where his ship would be waiting.

The whole of Greenland, except a strip of a few miles along the coast, is covered with ice, not a mere sheet, such as we find on high peaks or on the ground in winter, but an enormous hulk thousands of feet thick, under which elevations greater than those of the White mountains are entirely buried. The edge of this ice cap is cracked and seamed with dangerous crevasses; but on the higher ice just within this edge, it is as firm as marble and stretches to the horizon, a white plain, dazzling in full day and reflecting rose, pink, violet and orange when the sun is low at night. There are occasional hollows filled with drifts and slush, but these Lieut. Peary crossed on snowshoes on his former journey. His provisions, he and his companion bore on a light, strong sledge that also served to carry them down slopes with the speed of a tobogган and went briskly before the wind on level surfaces, with the aid of a small sail. So equipped, this courageous explorer would undertake a survey of Northern Greenland.

It is easy and perhaps natural to decry such experiments on the score of inutility, but results are better than forecast as a criterion of usefulness. This is an age of truth-seeking and of some truth-getting, and no fact, however remote it may appear from daily experience, or how trivial in its human relations, is valueless. The restless activity of the nineteenth-century explorers is balked by nothing, and if this officer does not determine the coast line of Northern Greenland, the risk and the honor may be assumed by a representative of some other nation. America, with Lieuts. Greely and Lockwood as its deputies, has "broken the record" thus far, and Lieut. Peary wishes to complete it. The plan he proposes is cheaper, more direct, more feasible than that of his predecessors, and it is safer. His mapping of the coast line would appease the hunger for geographical knowledge that dictates the resolve of men to find what sort of world this is upon which we live, and might prove of some economic worth. *Brooklyn Eagle.*

THE CAT IN ANTIQUITY.—At a recent meeting of the Academy of Inscriptions in Paris, M. Saglio discussed the question of "The Cat in Antiquity." Was the cat known to the ancients? If so, should it be considered as having been with them a domestic animal or a tamed one like the monkey or the gazelle? Some of the members, taking as a basis the differences established by Virchow of Berlin between the Egyptian cats (thousands of mummies of which are found in the cemeteries of Egypt) and the cat that we know to-day, claimed that the animal of antiquity and that of our time were no more the same animal than is the mouse of the present and the mouse of antiquity. The cat of antiquity, according to some, was slimmer, and resembled the weasel more than it did any other animal. M. Saglio presented to his audience the figure and the fac-similes on various monuments in support of an observation that he made on the subject. These were, primarily, paintings on Etruscan tombs in which cats are represented in the interior of dwellings. In one of them, especially, a kitten, during a repast, is seen playing with other animals under the couches upon which the guests are reclining. We find the cat figured also in the paintings on Greek vases of the fifth century before Christ. Upon two pitchers in the British Museum, the paintings on which seem to be due to the same hand, are to be seen domestic cats in the interior of a school of music. One is tied up by a string, and the other stands upright on a stool, and a young man is offering a cake to it. All these, and similar fac-similes, perfectly authentic, reproduce the image of a cat, perhaps a little slimmer than ours, but exactly like the animal that we now designate by the name.

SECRETION OF SILK BY THE SILKWORM.—Prof. G. Gilson is of the opinion that the silk of the silkworm is a regular secretion product. He bases this view on the fact that the glandular tube is covered internally, throughout its length, with a transparent membrane. This contains circular threads, and the spaces between them are filled with a network formation. As the silk is always separated from the cells by a membrane, it cannot be the result of the direct transformation of the protoplasm. In the next place the silk is not, as a rule, to be detected by any reagents in the body of the cell, but in some cases it becomes really visible. At the end of larval life, certain shining spherules were formed in the cells, and the reactions of these were just the same as those of silk. If one impedes the excretion of the silk at the end of larval life, the cell body becomes quite burdened with silk spherules. It seems that the silk is made up within the protoplasm, and is cast out through the meshes of the net-like membrane. A selection is probably made by the membrane itself among the several substances that are mixed with the liquid part of the protoplasm and the silk, and the substance that becomes the silk is cast out. The special apparatus of the silk duct seems to regulate the diameter of the thread, which is often very irregular before it has passed through it, and probably also to regulate the thickness of the thread.

THE SMALLEST FLOWERING PLANT.—The smallest flowering plant is *Wolffia microscopica*, a native of India. It belongs to the duckweed family. It is almost microscopic in size, destitute of proper stem, leaves and roots, but having these organs merged in one, forming a frond. There is a prolongation of the lower surface, the purpose of which seems to be to enable the plant to float upright in the water. The fronds multiply by sending out other fronds from a slit or concavity, and with such rapidity does this take place that a few days often suffice to produce from a few individuals enough similar ones to cover many square rods of pond surface with the minute green granules. Small as these plants are, they bear flowers. Two are produced on a plant, each of them very simple, one of a single stamen and the other of a single pistil, both of which burst through the upper surface of the frond.

RESPIRATION OF INSECTS.—Mr. Contejean has studied in the grasshopper the little known phenomenon of the respiration of insects. He finds that, contrarily to what occurs in vertebrates, the movement of inspiration is passive, while that of expiration is active. The air is expelled from the insect's body by a contractile effort. The result is, that if the animal be wounded, we observe blood to flow at every expiration. Decapitation does not arrest the respiratory movements, no more than does the absorption of curare, which in man produces an immediate cessation.

USEFUL INFORMATION.

How Gold Is Shipped.

As few people realize the vast bulk of gold coin that is shipped annually from one country to another, and are unacquainted with the manner of shipment, the following from the *American Banker* will be interesting:

The Bank of America is the largest single shipper of gold from New York, and indeed from the United States. Shipments are made in stout kegs, very much like the ordinary beer keg. Every one contains $50,000 in coin or bar gold. The latter is the favorite for these shipments, since the Government has permitted the Sub-Treasury to exchange coin for bar gold, as coin, in a single million-dollar shipment, is liable to loss by abrasion of from 8 to 20 ounces, or from $128 to $320; while the bars only lose about three-fourths of that value. Where coin is sent, double eagles are preferred. They are put in stout canvas bags, each containing 125 double eagles, or $5000; and ten bags fill each keg. About the only precaution taken against tampering with kegs is a treatment of keg ends technically known as "red-taping." Four holes are bored at equal intervals in the projecting rim of the staves above the head. Red tape is run through these, crossing on the keg's head, the ends meeting at the center, where they are sealed to the head by the hardest of wax and stamped with consignor's name. The average insurance is about $1500 per $1,000,000. There is an expense of about $2 per keg for packing and cartage aboard ship, or $200 for the same sum and the inevitable loss by abrasion, whatever it may prove to be. There are great Wall-street firms shipping from $25,000,000 to $40,000,000 annually. Some of these have for years insured themselves, and assert that the saving has been sufficient to replace a loss of $1,000,000. These are large figures, but this has become a country of large figures and affairs.

TO STRENGTHEN ROPES.—It has been suggested by a French exchange that, in order to insure greater strength, and consequently more safety, in ropes used for scaffolding purposes, particularly in localities where the atmosphere is destructive of hemp fiber, such ropes should be dipped, when dry, into a bath containing 20 grains of sulphate of copper per litre of water, and kept in soak in this solution some four days, afterward being dried; the ropes will thus have absorbed a certain quantity of sulphate of copper, which will preserve them for some time, both from the attacks of animal parasite and rot. The copper salt may be fixed in the fibers by a coating of tar or by soapy water, and in order to do this, it may be passed through a bath of boiled tar hot, drawing it through a thimble to press back the excess of tar, and suspending it afterward on a staging to dry and harden. In a second method, the rope is soaked in a solution of 100 grammes of soap per litre of water. The copper soap thus formed in the fiber of the rope is said to preserve it even better than tar is capable of doing, which acts mechanically to imprison the sulphate of copper, which is the real preservative in the case.

A SCIENTIFIC MOSQUITO BAR.—Word comes from Paris of the invention of what may be called the alternating mosquito bar. This consists of a mosquito net made of extremely fine copper wire woven into a cloth, which is strong and at the same time almost as pliable as a netting made of vegetable fiber. This net is made in the usual form of a canopy and falls in shining folds about the bed. In the dome of the canopy hangs a small electric lamp. Wires connect the netting with a weak pile battery placed under the bedstead, and by means of a converter are carried into the lamp. The lighted lamp attracts the attention of all the mosquitoes in the neighborhood, and they come sailing over and light upon the wire canopy. The battery presses the button, and the mosquitoes do the rest. M. Soherer, the inventor, says that on the first morning after his net had been put into use, his servant took up 3.22 litres, or nearly three quarts of dead mosquitoes.

THE RAPIDITY OF THOUGHT.—Much speculation has been set on foot in regard to the rapidity of thought; but Prof. Donders of Utrecht has recently made some interesting experiments in this direction by means of two instruments which he calls respectively the "neomatachograph" and the "nematachometer." His experiments thus far show that it takes the brain one sixty-seven hundredths of a second to elaborate a single idea. He says: "Doubtless the time required for the brain to act is not the same in all individuals. I believe, however, that these instruments may be so far perfected that we shall be able to determine the mental caliber of our friends without our friends knowing that we are testing their aptness." And again: "For an eye to receive an impression requires seventy-seven hundredths of a second, and for the ear to appreciate a sound, one hundred and forty-nine hundredths of a second is all that is necessary, which, however, acts with nearly double the rapidity of the eye."

TO CLEAN SHOES INSIDE.—A shoe dealer recommends the regular cleaning of the inside of the shoes, which he says are the most poorly ventilated of all the clothing. A solution of aqua ammonia slightly stronger than that used for bathing purposes may be applied to the inner surface of the shoes by means of a sponge fixed on a flexible wire.

GOOD HEALTH.

Health of the State

The monthly circular of the State Board of Health for October gives reports from 80 localities, with an estimated population of 754,639, the deaths being 1016, an annual death rate of 16 08 per thousand.

Among the causes of death were: Consumption, 150; pneumonia, 56; bronchitis, 20; croup, 18; cholera infantum, 32; diarrhea and dysentery, 13; typhoid fever, 36; cancer, 20 [below the monthly average for the year thus far.—EDS. PRESS]; heart disease, 89; alcoholism, 15; other diseases and those not classified, 457.

Diphtheria is charged with 39 deaths, which is a large increase over the mortality caused by this disease last month. Twenty of these deaths occurred in San Francisco, where the disease is quite prevalent.

Important Suggestions in Regard to Diphtheria.

Diphtheria and croup have been quite prevalent during the month, assuming a malignity in many cases that has been quite unusual hitherto.

In view of this prevalence, the State Board of Health has deemed it advisable to publish, for gratuitous distribution, a small pamphlet on the disease, its restriction and prevention, which can be had on application to the secretary in Sacramento.

The conditions being favorable for the development of the disease, the local health authorities should look more strictly to the public safety than they apparently do in the presence of these cases of diphtheria. They have the power of requiring from those persons attacked in that regard to residence and otherwise they shall so conduct themselves as not to unnecessarily multiply the chances of extending the affection to others. Public funerals shall be strictly forbidden, and the transportation by rail of those dead from diphtheria should not be allowed, except under the most stringent provisions and competent inspection. Each case of such disease is a public danger, against which the public is entitled to be warned by proper information.

Any person knowingly having this disease under his care or control, who voluntarily neglects to take all the necessary precautions to prevent its spread, should not only be punishable by penalty as for an act of nuisance, but should be liable to pay pecuniary damages for whatever harm he may occasion to others. At this time it would be well for parents to keep a watchful eye upon the animals with which their children play, as it is a well-ascertained fact that dogs and cats are very frequent carriers of infection into a household. An instance occurred in Sacramento where a pet cat contracted diphtheria from a sick child and conveyed it to a neighbor's child who unfortunately played with it just after it had left the infected home. Cats having diphtheria generally display it by a yellow discharge through the nose, a gummy secretion about the eyes, a hoarse voice and a desire for quiet and seclusion. Dogs are not nearly so subject to diphtheria as cats, but are liable to carry the infection on their hair. A curious fact, recently discovered by Dr. Klein, and confirmed by the health officers in London, is that cats suffering from diphtheria manifest the disease more frequently in inflammatory deposit in the lungs than elsewhere, and while in this condition they were as capable of communicating the disease to children as when it manifested itself in the throat and nose.

In San Francisco the disease is reported as almost epidemic, and ascribed to emanations proceeding from filthy sewers. It was also quite prevalent in Sacramento in the vicinity of the drainage canal. It is also reported in many of the interior towns. The extension of this disease to so many parts of the State may, perhaps, be attributed to some condition in the atmosphere of which we are ignorant, but we do know that wherever the germ is deposited it is nurtured in filth and developed where sanitation is deficient.

Precautions to Be Taken in This City.

The important suggestions given out in the above report of the State Board of Health should be carefully considered and closely attended to. The Board of Health of this city are fully alive to their duty here and are taking active precautions to check any further spread of the disease. It is generally conceded that the chief cause of the prevalence of the trouble in this city is the foul condition of the sewers. In addition to flushing, it is proposed to secure better ventilation by opening the sewer cover at the highest points so that the gases, which always ascend, may be allowed to escape into the open air, instead of through imperfect plumbing, into our dwellings.

The suggestion has also been made that the schools should be closed for a short time; but the indications are that we have already seen the worst, and that the flushing and more perfect ventilation of the sewers will be sufficient to arrest the destroyer.

ELECTRICITY.

The Possibilities of Electricity.

The possibilities of electricity are rapidly being developed into actualities, which are changing business methods, making neighbors of cities hundreds of miles apart, and realizing the dreams of even Edward Bellamy.

The most interesting of recent electrical incidents is the development, purely as a business project, of the facilities for the transmission of any kind of vocal or instrumental music or entertainment to any number of places at great or small distances.

A few days since, says the New York *Times*, some experiments were made in the office of the American Telephone Company at New York. In the first place the telephones were tested. Boston, 300 miles away, was rung up, and then ensued a pleasant conversation. The operator in Boston was a young woman, who at once struck up a spirited discussion of the latest development in theosophic Buddhism. Her voice was not raised so much as in ordinary talking, and its expressiveness was perfect. Washington, 235 miles away, was also tried. Every word was heard distinctly.

The efficiency of the metallic circuit telephone is fairly well understood. The circuit now comprises 42,000 miles of copper wire, and Boston, Providence, Worcester, Springfield, Albany, Syracuse, Rochester, Buffalo, Elmira, Wilkes Barre, Philadelphia, Baltimore, Washington and many other big cities are reached with ease and expedition. Business houses are rapidly learning to use the long-distance wires to the greatest advantage. The telephone no longer holds the position of messenger—it is now the confidential agent. Many big firms use it systematically. Several, for instance, engage wires for the first 20 minutes of each of ten hours in a day. The head of a firm can from a distance direct his city affairs and dictate letters exactly as if he were in his own office. Great numbers of wholesale houses are saved the expense of keeping large quantities of goods on hand. All arrangements for sales and shipments can be made directly with the factory.

Recently a well-known corporation in Boston, having several members in New York, held a meeting "on the wire," as it were. The roll was called, resolutions were passed and all business was transacted, the New York members taking an active part, but being able to do it in a fraction of an hour and saving the time, expense and trouble of a journey to Boston.

These are but a few examples. Every day the use of the wires is increasing, and every day the line is being pushed nearer to Chicago. It will reach there in the course of a year, and the entrance of the long-distance phonophone into San Francisco is only a matter of time and capital.

The phonograph will play an important part in the scheme of transmission of music, etc. When the multiple resonator is perfected it can be attached to a phonograph and connected with the wires, taking the place of the orchestra or lecturer, and the death of great musicians will not by any means necessitate a cessation of the enjoyment of their renderings of music.

A POWERFUL ELECTRIC LIGHT.—An English paper says: Usually we look to America for the biggest things on earth, but strange to say, although the Americans are the most extensive users of electricity, the most powerful artificial light in existence is the property of the English Government, and is to be found in a lighthouse on the Isle of Wight. The light is obtained from a carbon lamp of special pattern. The ordinary light is equal to *three million candles*, but a light of six-million candle-power can be and has been obtained. It is impossible for any one who has not seen it to imagine the wonderful brilliancy of the light, but some idea may be formed from the fact that it can be distinctly seen 45 miles away, and that at the Needles, 14 miles distant, it is quite easy to read very fine print by means of the reflection.

ELECTRIC CARS.—Nearly 2000 electric cars are running in the United States. Boston alone has about 100 miles of electrically operated roads. Several systems have been developed to a perfection that insures smooth and regular service. Other systems are still more or less in the experimental stage.

STORAGE BATTERY TRACTION is being rapidly pushed in New Orleans. Thirty cars in all are to be installed within the next few months. Thirty trucks are already mounted with motors and prepared to receive the car bodies.

A STEEL PLANT, it is reported, has just been located at Jacksonville, 12 miles north of Anniston, Ala., which, when complete, will employ 3000 hands. It is placed by the Eastern syndicate at a cost of $3,000,000. The product of the plant will all be worked up by the company in other plants, located for that purpose.

THE WOONSOCKET RUBBER CO. has just completed and put into operation the largest rubber shoe factory in the world.

THE National India Rubber Co. of Bristol, R. I., employ 1000 hands and pay out $37,000 monthly for wages.

The Knowledge of the Ancients.

The opinion seems to be gaining ground that we, of this age, do not fully appreciate the progress which the people of the early ages of the world had made in science and the mechanic arts. Some of the remains of early architecture and evidences of scientific research anterior to and quite down to the builders of the pyramids are a puzzle to us, unless we admit that the people of those days were much further advanced than they are generally supposed to have been.

Our attention has been drawn in this direction by a singular publication, which has recently made its appearance, entitled "A Wonderful Discovery in the Book of Job," wherein it is argued that in the time of Job not only the motive-power of steam was known, but that the locomotive and the modern railroad was also known and employed. Mr. Samuel O. Trudell is the author of the book in question, which consists of not less than 362 octavo pages. Mr. Trudell holds that the Behemoth of Job was the steam engine, and the modern railroad was the Leviathan. The description of these two "animals," as they have heretofore been thought to be, has always puzzled the scientists; but our author has endeavored to throw some new light upon the subject. Of course Mr. Trudell, being a thorough Hebrew scholar, comments on the Book of Job in its original language—he is his own translator.

The *Scientific American* cites from the special translation which is appended to the book some of the most striking passages, as follows:

The account begins chap. xl., v. 15: "Behold now one with great heat, . . . he will consume fodder as well as cattle do," which is a pretty fair description of a steam engine. A little farther on, v. 17, it says: "His tail will set upright like a cedar." This, the author concludes, refers to the smoke-stack. In v. 18 we find, "His hollow bones are tubes of brass, his solid bones are bars of iron," which is a very good embodiment of modern engineering practice. In v. 21, which the special translation renders, "He will rest beneath light shelters and within a covering of fibrous reeds and clay," the author finds an allusion to non-conducting covering for boilers and steam pipes. Going on to the next chapter, we find v. 6 thus rendered, "Companies will feast upon him, they will share him among speculators," which it is needless to say fits the case of modern railroad companies and speculators exactly. This is one of the extraordinary parallels of the work. It is perhaps equaled by v. 2 of the same chapter, where the hook (ring) in the monster's nose is construed as an allusion to the piston rings of a locomotive, and where the jaw bored through with a thorn supplies an allusion to the piston head bored through with its piston rod. The bad effects of an engineer allowing his water to run down is given in the same chapter, v. 26: "From dryness rendering him furious, he will not have power to withhold; the curved vault being caused to break up and also the armor." This, of course, means that the engineer must watch his water-gauges or there will be an explosion.

For a portion of v. 23, chap. xl, and for v. 24 immediately following, the author furnishes the following translation: "Behold he will absorb a river and will not fret; . . . . he will gather it up in his fountains by means of traps and with a perforated nozzle." Our author in this finds described the action of a pump with its valves (traps), and the perforated suction pipe with a screen at its end to exclude solid particles. Even the coupling together of a train of cars is found in v. 1 of the next chapter: "Thou wilt extend Leviathan with a hook, or with a snare which thou wilt cause his tongue to press down." The tongue our author believes is the representative of the coupling link, and the hollow drawhead and pin is the "snare." The calking of the seams of the boiler is found in v. 15 of this chapter: "His strength depends on courses of shields closed up tightly with a seal." Our author finds nothing clearer than that the "shields" are boiler plates, and the "seal" the calking iron. He reserves, however, the possibility that the steam riveter is the sealing mechanism.

This much is enough to give an idea of the book. The author has been his own Hebraist. The Semitic student and author, Rabbi Benjamin Szold of Baltimore, testifies to his high opinion of Mr. Trudell's translations. It must also be said in conclusion that the subject is treated throughout with full evidence of critical discernment and laborious investigation.

TO KEEP PANS FROM RUSTING.—Tin pans can be prevented from rusting by heating them and rubbing well with linseed oil and heating again. Wood ashes or whiting (which is better) mixed with kerosene will brighten them.

CINCINNATI, OHIO, produces the largest amount of wood-working machinery in the world.

A CHICAGO firm lately received an order for $130,000 worth of machinery for China.

MINING AND SCIENTIFIC PRESS

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[NEW THIS ISSUE.]

Hydraulic Engine—Rife's Hydraulic Engine Mfg. Co., Roanoke, Va.
Situation Wanted—"Gringo."
Works for Sale—W. M. Smith.

See Advertising Columns.

Passing Events.

The fruit season drawing to a close has been one of the most successful in the history of the State.

The threatened Indian troubles assume toward the end of the week a more serious aspect, affairs in the Dakotas being grave indeed.

The striking ironmolders in this city claim for the movement a gratifying success, in that the strikers have for the past eight months been able to live comfortably and without work on the money donated by sympathetic guilds and friends of the cause.

In this connection, it may be stated that the boycott has, by a finding of Judge Armstrong, just promulgated, been decided to be illegal.

The price of silver, after dropping in the early part of the week almost as low as it ever has been, rallied later on, being quoted at 99 cents at the time of our going to press. Further improvement in the price is counted upon.

Stocks of most kinds have also recovered in part from their recent tumble.

The controversy between Stanley and his followers continues to be waged through the columns of the newspaper press to the damage of the contestants and the disgust of the public.

Of the weather during the week there is nothing new to be said, it having been of a piece with that which has obtained for the past eight months. The sun coming up over the Sierra and traversing an atmosphere all aglow with yellow light has gone down in the ocean, repeating this journey day after day till we Occidentals tire of this too protracted Indian summer. We would be glad now to exchange a few of these baleful days for a like number dripping with rain and sleet, even at the hazard of their bringing with them the southeast tempest. After such continued drouth we would be willing to accept a drenching rain coupled with the cyclones so often visited on the ungodly people east of the Rockies. Could we dodge the thunderbolt as adroitly as they, we would also willingly take in that.

Though the rains have been so long withheld, the water supply continues good, owing to the immense quantities of snow that fell on the mountains last winter.

An Important Factor Ignored.

The advocates of free trade, in considering its application to this country, strangely overlook the fact that we are not only large importers of the products and manufactures of other nations, but that we are large importers of their labor as well. We not only take their surplus wares and merchandise, but we take also their surplus population. Under this arrangement the condition of things here is altogether unusual and exceptional, the above practice obtaining with no other large and progressive nation in the world. We admit into the United States from European countries more than a quarter of a million people every year, the majority of whom having reached maturity want employment as soon as they get here.

A large proportion of these immigrants are mechanics, artisans, or factory hands, and cannot well earn a living except at that particular branch of business to which they have been trained. But to start this business, whatever it may be, they have not usually the means, wherefore they must abandon it to their great detriment or remain idle, unless other parties able to do so can be induced to start it, and thus afford them an opportunity to earn a subsistence at the calling for which they are best adapted.

But who is going to do this unless protected by a tariff that will enable them to successfully compete with the cheap labor of the countries whence these immigrants come, and which they have left just because labor has there been reduced to starvation prices? Certainly, no one; which being the case, what is to be done with these immigrants so left without work or other means for supporting themselves?

Set them to cultivating the land, of which we have so much still remaining unoccupied, say these free-traders. But these lands are far remote. It requires money to reach and improve them, which, as stated, these poor people do not possess, nor have their previous habits and training been such as to fit them for successfully pursuing the business of farming. Moreover, the cultivators of the soil might not care to see so many rivals coming in to share with them the scanty profits of their already crowded vocation. That new factor in our National politics, the Farmers' Alliance, might and doubtless would prefer to see this foreign element employed at something else—might possibly prefer to have it wholly excluded from the country.

Clearly, then, we must either stop this importation of laborers or find something else than farming for them to do. What shall it be? Can these free-traders tell us? Where is this army of poor, helpless foreigners that is every year being landed on these shores to go? What shall we do with them? We cannot reship them to the places whence they came; we cannot drive them into the sea, nor does it seem possible for us to prevent their coming in hereafter.

It is singular that this aspect of the industrial problem should so have escaped attention. Never, so far as we know, have any of our political economists considered this immense importation of labor into the United States in connection with its bearings on the question of a protective tariff. These theorists adopting a rigid rule adhere to it under such exceptional conditions as here prevail. Because free trade may be a good thing for some countries, they conclude it must be good for all, and so devoid of sound business sense and practical wisdom, they ignorantly disseminate the most pernicious teachings, thereby antagonizing the best interests of their own country.

A Country Worth Looking After.

A bill providing for the exploration of Alaska and appropriating $100,000 for that purpose has been placed on the calendar of the House of Representatives. By the provisions of this bill a detail from the army is to be stationed in the interior of the Territory and there retained for such length of time as will enable the same to be thoroughly explored and its mineral and other natural resources ascertained, as far as may be. This bill ought to be enacted into a law as soon as possible.

While the exploration of most other portions of the public domain may be left to be effected by private enterprise, this will not do with Alaska. With its rigorous climate, long winters and short summers, with its mountains, morasses and rivers, its extent and remoteness, neither individuals nor small parties, nor yet large companies, are equal to the task of exploring this vast and gloomy region. This is a business that will even severely task the resources of the General Government, if it is to be soon accomplished and with much thoroughness.

The work is one of great difficulty and appalling magnitude. The climate and conditions throughout are about as bad as they well can be. The weather is more or less stormy most of the year, frequent and heavy rains in the summer and deep snow falls during a good part of the other months. The cold is intense, ice forming on the lakes and all but the larger streams to a great thickness. The distances to be traversed are frightful to contemplate. The Prihyloff Islands, the center of the seal fisheries, lie 500 miles to the westward of the Alaska Peninsula, which in turn is a thousand miles west of the long coast strip, site of the gold mines now being worked. But this strip, though nearly a thousand miles long and comprising an area larger than all the New England States, constitutes a mere outlying fragment of the main Territory.

This distant province is becoming an important portion of the republic. The exports for the past year amounted to $10,000,000, $2,000,000 of which were gold. The output of the mines will be likely to increase rapidly hereafter, coal, lead and copper coming in to supplement the product of the precious metals. After a time lumber will be exported and possibly ice, the curing and canning of fish expanding meantime into an immense industry.

In view of such probable growth, the boundary line between this country and British Columbia should be ascertained and fixed as soon as practicable. A regular form of government should also be provided for the Territory, to the end that the inhabitants be enabled to enact such local laws as may be needed and otherwise manage their home affairs. Alaska is worth looking after and should in no vital particulars be neglected by the General Government.

The Money Panic and Its Lesson.

The past week the money centers of the world have been rocked in the throes of a stock panic that has not had a parallel for nearly two decades. The panic has been sweeping in its effect, affecting to a greater or less extent every industry. It carried in its wake the fortunes of many thousand persons, besides tottering to their very verge many moneyed institutions whose previous financial standing was firmly set in the confidence of all classes. One of these, Baring Bros. of London, England, after weathering the blast of many financial storms, was made the past week to bend in submission to the irrevocable, and had not assistance been rendered by leading banks in Europe, their failure would have followed. Such a calamity would have drawn many more into the abyss. As an example of the effect of the panic, it is authoritatively stated that the shrinkage in the value of securities held by Baring Bros. within a few short hours was over $50,000,000.

Conservative and well-informed readers of the signs of the times have looked with discredit upon the situation abroad, and held to the opinion that it could only be a question of time when a reversal had to set in which would financially swamp all who had not prepared for the worst. Speculation, particularly in England, has been rampant. Any scheme placed before the public with glittering generalities was easily floated. Trusts, syndicates, and all conceivable schemes were hatched by designing persons, and made attractive by pointing to fictitious profits. Speculation was not confined alone to private enterprises, for several countries, seeing a rare opportunity to float bonds and other securities, placed large quantities at such attractive prices that they were readily absorbed. It was the carrying of these securities that caught the old conservative house of Baring Bros.

While the many lost fortunes are to be deeply deplored, yet they leave a lesson that is easily mastered, viz.: There is not enough metallic currency in the civilized countries to safely conduct the large and constantly growing international commerce of the world. Of course the above assertion refers to mono-metallic currency. There can be no longer the question of a doubt but the stand taken by farmers, as expressed individually and through their organization, in favor of bimetallism, is thoroughly correct. The scarcity of money, based on a gold standard, has proven a magnet to draw high rates of interest to the moneyed few, besides allowing large unscrupulous speculators to successfully run corners and deals to the detriment of legitimate business and financial loss of the many engaged in farming or other industries.

It is to be hoped that at the next session of Congress the lesson of the times will be heeded and the free coinage of silver become a law. This country is rich enough in all the elements that go to constitute a leading nation to take the lead in favor of bimetallism and let other countries follow, which they will do, convinced by our prosperity that it is to their best interest.

Some of the Benefits California Derives from Mining.

It is calculated that there are 30,000 men engaged in mining for the precious metals in California, this being aside from some 6000 or 8000 who find employment in such branches of mining as relate to the production of copper, coal, salt, quicksilver, petroleum, borax and various other mineral deposits now being utilized in different parts of the State. The value of these several products, gold and silver included, amounts to hardly less than $20,000,000 per annum, the number of miners, as above stated, representing a population of about 100,000 souls.

Suppose now this entire mining industry were extinguished—suppose these miners distributed over the State were to engage in other pursuits and California, instead of producing all the salt, borax, quicksilver and most of these other commodities that she requires, were to import the same from other countries—has any one stopped to think what a difference it would make in the industrial condition of the State? If only gold and silver mining were destroyed and those engaged in it forced to seek employment in other pursuits, what widespread ruin would ensue. What would our farmers, stock-raisers and fruit-growers think of having 15,000 or 20,000 workers added to their number, the markets for much of what they raise being at the same time cut off? What a fatal difference it would make to the cultivators of the soil, this converting so many consumers into producers of the things they make and raise.

With their vocation abandoned or wiped out, what multitudes of these miners would become mechanics and artisans or enter the ranks of the day laborers, competing with those who are now seeking to make a livelihood in these various callings! What impoverishment and distress would such event entail upon not only the wage-earners, but upon the farmers and other producers as well!

It is time that all classes in California should give proper consideration to the importance of mining, reflecting how much of their prosperity is due to this. Poor everywhere are the countries that are lacking in mineral resources or in which their active development is neglected, the Chinese and other Oriental peoples being evidence of this. The advancement made in this industry measures more accurately than anything else a nation's progress in wealth, civilization and power. Let our economists, legislators and all others give due heed to this.

THE world's annual production of salt is 7,300,000 tons, of which England produces the largest amount.

Cinchona Cultivation in India.

[Written for the PRESS by LORENZO G. YATES, F. L. S.]

From the Annual Report of the Government Cinchona Plantations in Bengal for the year 1889-90, we learn that at the end of the year the number of cinchona trees of various ages under cultivation at the plantation amounted to 4,682,401 and a nursery stock of 264,000 seedlings.

The crop of bark collected during the year amounted to 304,705 pounds, from which was manufactured 6393½ pounds of febrifuge; 1252 pounds of quinine, and 34 pounds of crystalline febrifuge which was distributed to the various medical depots and Government officers and upon which the Government realized a handsome profit—the result of careful and skilled cultivation and management by the superintendent and his associates.

Santa Barbara, Nov. 12, 1890.

The World's Coal and Iron.

Investigations made by Mr. G. G. Colcholm of the rates of increase in the amount of coal production in different countries have developed some interesting facts, says the Virginia *Manufacturer*. Since 1860 the rate of expansion has been less rapid in the United Kingdom than in several other countries, notably the United States and Germany. If the same average rates of expansion were continued indefinitely in the future for the United Kingdom, the United States and Germany, respectively, as are found by calculation to have been maintained for these countries between the mean of the three years 1879–81 and the mean of the three years 1886–88, then the coal production of the United Kingdom would be overtaken by that of the United States in 1894, by that of Germany in 1928, and by the aggregate coal and lignite production of Germany in 1919. A similar examination of the rates of growth of the production of iron shows that in this industry these two countries appear to be gaining still more rapidly upon the United Kingdom. This is important as tending to bring about a diminution in the rate of increase in the demand for British coal.

Hitherto the industry of the chief industrial countries has been greatly stimulated by the rapid extension of railways. An examination of railway statistics since 1840 shows that the new mileage required year by year all over the world has increased on the average at a pretty high geometrical rate. This is brought about by the construction of railways on a great scale in different parts of the world successively. Regions in which railways have long been laid show no such rapid increase in the amount of new mileage. This leads to the conclusion that sooner or later a time will come when the rate of increase of the railway mileage of the world will be greatly reduced. That would probably involve a pretty severe check to the growth of the demand for iron, and indirectly that of the demand for coal.

THE newly started industry of shipping salmon East on ice is meeting with great success. Both the Williams and the Pacific fish companies are sending a large amount daily.

THE Billings & Spencer Co. of Hartford use up eight tons of copper a month in making commutator bars for dynamos.

Recent Additions to the State Mining Bureau.

The following additions to the cabinet and museum of the State Mining Bureau have recently been made, some through donations or purchase and others through the efforts of the State Mineralogist in person, or of his assistants in the field:

Epsomite (hydrous sulphate magnesium), crystallized, Napa Co., Cal.; J. Z. Davis.

Diatomaceous Earth, Redondo Beach, Los Angeles Co., Cal.

Wire Gold, from the White Bull mine, Oregon; Melville Attwood.

Chalcopyrite (sulphide of copper and iron), 500-foot level of the Union mine, Copperopolis, Calaveras Co., Cal.; A. Ogden.

Ottrelite, a variety of chloritoid (hydrous silicate of aluminum and iron), Yreka, Siskiyou Co., Cal.; M. Carrick. First occurrence of this mineral in California.

Petrified sandstone, surface carbonized. From the Wealden clay of the Lower Cretaceous Period, near Hastings, Sussex, England; W. L. Watts.

Eudialyte (silicate of zirconium iron and sodium), Hot Springs, Arkansas.

Mixite (hydrous arseniate of bismuth and copper), Copperopolis mine, Tintic D., Utah.

Cyrtolite (a variety of zircon), Llano Co., Texas.

Half real of Augustine Iturbide, first Emperor of Mexico, 1822, and demi of Maximillan, 1864; C. F. V. Peterdorff.

Manganese ore (pyrolusite), Greenwood, El Dorado Co., Cal.; Alex. Keiler.

Copper ore, from ranch of H. Laurence, near Junction City, Trinity Co., Cal.

Garnet rock, Weavertown, N. Y.; M. Braverman.

Cement rock, Suisun valley, Alameda Co., Cal.; Pedro de Salazet.

Sandstone, Diamond Quarry, Utah Territory; J. R. Walker.

Oak, resembling the Irish "bog oak," being a piece of a canoe of the ancient Britons, found at the bottom of Loch Leven, Scotland; Jas. Sullivan.

Magnetite (carb. magnes.), near Yountville, Napa Co., Cal.; R. E. Towle.

Serpentine with vein pyrolite, mother lode, Amador Co. Cal., Dr. Boyson.

Besides the above, more than twice as many other specimens have been added to the cabinet of the Mining Bureau during the past two weeks, denoting for this collection a rapid growth, many of the specimens so gathered in being of great interest both in an economic and scientific point of view.

WIRE is now manufactured of iron, copper or brass, by a new and greatly improved process and at a considerably reduced cost. The machine devised for this purpose consists of a series of rolls in a continuous train, geared with a common driver, each pair of rolls having a greater speed than the pair preceding it, with an intervening friction-clutch adapted to graduate the speed of the rolls to the speed of the wire in process of rolling. The entire operation of producing the smallest sized wires from rods of one-half inch is done cold. It is alleged that this method obviates the danger of unequal annealing and burning in the furnace. In addition to this, the wire, being more flexible and homogeneous than that made by any ordinary method, is capable of greater sustaining longitudinal strain.—*Industrial Gazette.*

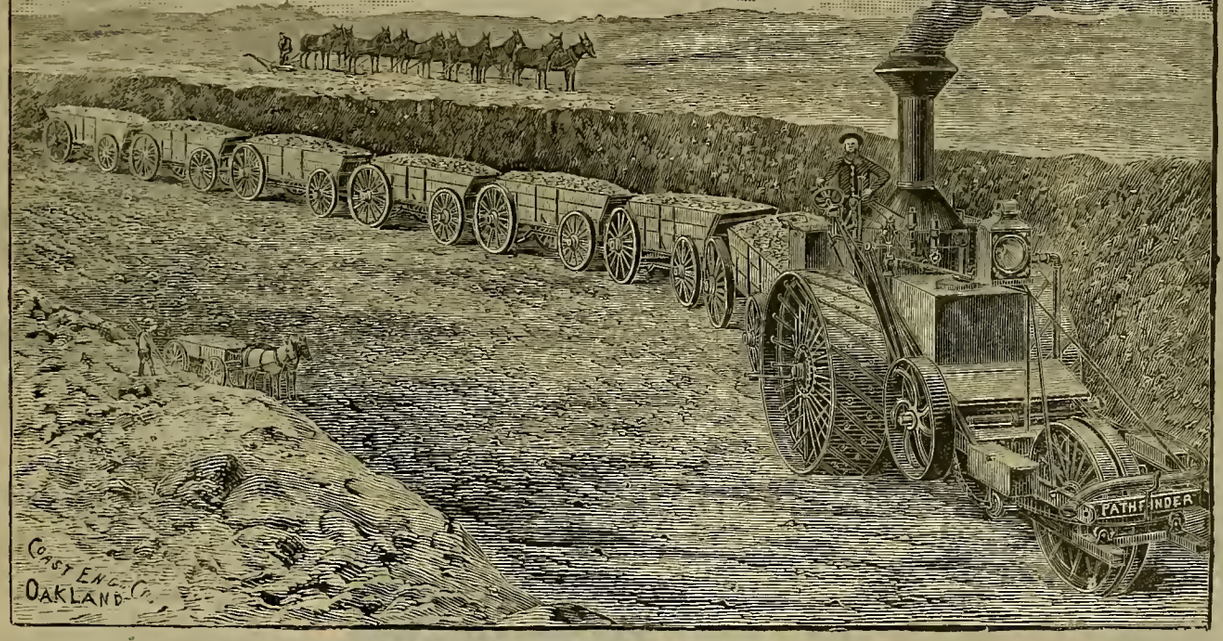
Best's Traction Engines.

During the last ten years the trend of population has been toward our villages and cities. The increase of this population, as compared with the growth of the country, has been far beyond anything in the history of our nation. It is an economic question that has given food for thought to our political economists and statesmen, and as yet they have found no remedy to change the status of affairs.

With the growth of the villages and cities it has invited a spontaneous effort to adopt sanitary regulations and improvements and attractions that should make city life conducive to longevity, and with the advantage of schools and associations, it seems that this system will continue to enlarge rather than diminish.

The city of Sacramento is built upon a level plain, and during the winter months the streets have been almost impassable on account of the sticky, adobe mud. Recently, by an almost unanimous vote, a large amount of money has been appropriated to make the road-beds and streets of Sacramento equal to, if not superior, to any city on the coast. Fortunately for them, about four miles out is one vast gravel-bed made up of pebbles from the size of a walnut to a hen's egg, without any boulders and with just enough dirt intermixed to form a cement that makes a road-bed that is always firm in wet weather and smooth and well adapted for carriage driving.

Recently the trustees have employed all the teams they could hire to improve the streets, but finding the old method too slow, they have called into requisition the services of "Pathfinder," one of the traction engines built by Daniel Best.



BEST'S TRACTION ENGINE HAULING GRAVEL.

The accompanying cut is a good reproduction from a photograph taken at Sacramento while at work in hauling earth from the gravel-bed, four miles out from the Capitol City. This train is run night and day, making from six to seven trips at a cost so low that the authorities are contemplating the project of gravelling the streets generally in the city.

We quote the following publication concerning this valuable invention:

It was declared at the late California State Fair, held in Sacramento, after a three days' plowing contest, that the Best traction engine has no superior, the first prize of $500 having been awarded to its inventor and manufacturer, Mr. Daniel Best of San Leandro. Up to the year 1887, field locomotives had been partial failures. It is to the credit of Mr. Best that, of twenty-five or thirty engines built at his manufactory in San Leandro, each one has been in continual and practical use ever since. He has recently received three orders for engines to work in the Sierra Nevada mountains, hauling lumber, ore, etc. One of his machines has invaded the Sandwich Islands, where it is engaged by day in plowing sugar and cane fields, while by night it runs a dynamo at the factories, for the purpose of furnishing electric light. In Sacramento his premium engine, "The Pathfinder," is employed in hauling gravel to pave the streets of the city. During the fair his engines were used to convey people to and from the park. We quote the following from the State Fair Daily 1890:

"Have you seen the Best steam harvester in operation on the vacant lot adjoining the pavilion? If not, attend to the matter at once and you will witness one of the grandest sights of the nineteenth century. You will see a mammoth traction engine, with a huge combined harvester attached, rushing about, now turning sharp curves, now backing as swiftly as it moved forward, now stopping suddenly, now starting, now reversing with as much ease as a locomotive, and in general exhibiting all the traits necessary to the complete success of a steam traction engine. Crowds are daily witnessing this great spectacle. Best's steam harvester may be utilized as a stationary threshing outfit by simply bringing the machine to a standstill whenever desired, and throwing in the material to be threshed. It will plow and harrow, haul grain, lumber, wood, coal, ore, etc.

Winter Protection for the Vedalia Cardinalis.

On page 331 of this issue we give an illustration of the glass houses erected at San Gabriel by the State Board of Horticulture for the winter protection of the *Vedalia cardinalis*, the ladybird imported from Australia to destroy the cottony cushion scale that was doing such great injury to our citrus groves. The following description of the houses is by B. M. Lelong, the secretary of the State Board of Horticulture:

The winter of 1889–90 was a very severe one upon the increase of parasitic and beneficial insects, as it rained almost continuously until spring. This was the vedalia's first winter in California, and grave doubts were entertained as to their living through it. In early spring (1890), it looked very much as if they had died out, as neither the larva nor the beetles could be found; but a few weeks of warm sunshine caused them to multiply, and our hopes were gratified by discovering thousands of the larvæ at the various places where they were put, with due precaution, late in autumn and before the wet weather had set in. From these pieces, all infested orchards throughout the State have been supplied with colonies.

The board, at its meetings Aug. 14, 1890, resolved unanimously to at once erect two glass houses, covering large orange trees, where the destructive cottony cushion scale (*Icerya purchasi*) can be thickly colonized, and at the approach of inclement weather place a few of the *Vedalia cardinalis* in one of the houses, reserving the other for later use should the first become overstocked. In this manner the board hopes to preserve this wonderful insect to the fruit-growers of California.

This course was prompted by the experience of last winter. In the spring it was almost impossible to find a living specimen, and as the cottony cushion scale reappeared in a number of groves where it was supposed to have been exterminated, having passed through the winter under the ground at the collar of the tree, under a weed, or in some way secure from the attacks of the vedalias, at the approach of warm and congenial weather, the scales hatched and developed with such rapidity it created considerable alarm among orchardists.

The experience of the past few years was too fresh to again allow the scale to become established. The Icerya is now very scarce, and the possibility of the vedalia passing through the winter months is now reduced to a minimum.

The board has had erected at San Gabriel, Los Angeles county, two glass houses, a good idea of which can be had by reference to the accompanying photo-engraving plate. They are at the orchard of Col. J. R. Dobbins, and are octagonal and so designed that they present a good surface to the sun, and are thereby warmer and more suitable for the propagation of both scales and ladybirds.

The dimensions are each 16 feet in diameter by 18 feet in elevation; every part is well fitted, and the ventilation protected by very fine brass-wire mesh, to guard against the entry of any ladybirds before the cold weather sets in, otherwise the scales would be destroyed by them early in the season; and also to prevent the ladybirds from escaping during the time they are being colonized for distribution in the spring.

Many are of the opinion that this most important foe to the baneful icerya "has come to stay," but there are no facts upon which to base such an opinion, beyond the fortunate results of the past winter, when they passed through it unprotected. There is too much at stake, and the risk of them dying out is too great to allow this to be again repeated. It is to prevent all possibilities of a failure that these precautions have been taken.

THE Messrs. Colt, Hartford gun-makers, gave $1,000,000 for the right to make in the United States, Gifford's new carbonic acid gas gun, which kills at 600 yards. This is expected to revolutionize gun manufacture and the art of war. "The more fearfully destructive war is, the more unlikely."

CHICOPEE will be greatly benefited by the starting up of the bicycle manufactory of the Lamb Knitting Machine Company, as they will employ about 200 hands.

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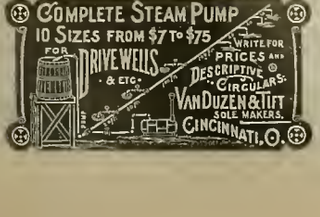

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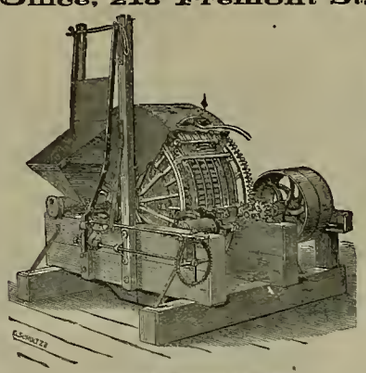

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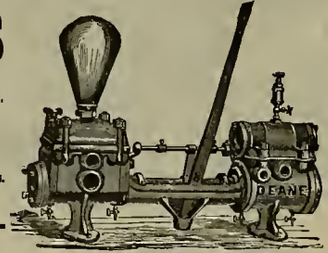

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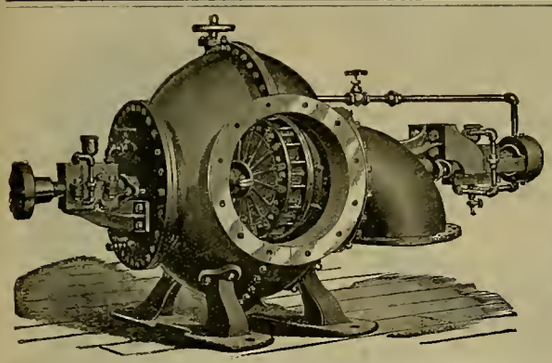

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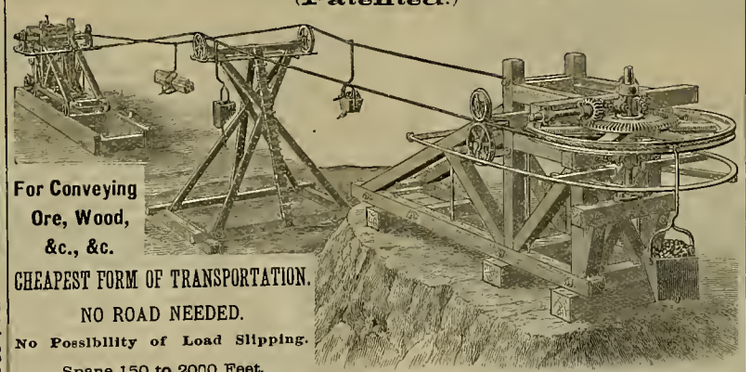

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Nov. 20, 1890.

General trade the past week was fairly active for the season of the year. The local money market worked closer under free remittances to the East and a fairly active call for funds to take advantage of the decline in stocks. Two or three stockbrokers failed, while several more were forced to unload some of their holdings. This is about the only inconvenience or disturbing effect had on our market as a result of the stock panic in London and New York.

MEXICAN DOLLARS—The market is dull and heavy at about 81c.

SILVER—The Department at Washington purchased on Nov. 17th 745,000 ounces at $1 to $1.005 an ounce, and on the 19th, 500,000 ounces at $0.971 to $0.9825 an ounce. With the latter purchases the 4,500,000 ounces for the month were secured. No further purchases will be made until December. The silver markets abroad and at home suffered severely by the stock panic and consequently close money market at the East and in London. From all we can learn, many holdings were forced on the market and into stronger hands. It is also said that there is quite a short interest on the market, not only in silver but in all securities based on the market value of silver. If this proves to be correct, then it will be only a question of a short time when the price will go up again, but it is not likely, unless we have more favorable legislation, to go as high as it did in the early summer months. Telegrams received to-day from New York report market quotations at 98⅛ cts. In this city there is no demand except at lower prices than holders are willing to submit to.

QUICKSILVER—Receipts the past week aggregate 310 flasks, and exports by sea 194 flasks to Mexico, In October, rail shipments overland aggregated 81,330 pounds. The market is fairly active at easy prices.

BORAX—Exports the past week aggregate 21,090 pounds to New York. In October, the overland shipments aggregated 8265 centals. The market is steady at current quotations.

ANTIMONY—In October, 20,000 lbs. were shipped overland. The market is barely steady.

LIME—Receipts the past week aggregate 3963 bbls. The home demand continues free for the season.

IRON—Imports the past week aggregate 410 tons from Oregon. The market is fairly steady, kept so by the absence of a marked selling pressure. Foreign advices report the markets temporarily affected by stringent money markets, making reliable quotations difficult to give. Eastern mail advices report the tone steadier.

TIN—The spot market for both pig and plate is dull and barely steady. Heavy consignments of the latter are on the way, in order to get advantage of the present tariff before the high duties take effect. The European market is unfavorably affected by the decline in silver.

LEAD—The local market has an easier tone, although no lower quotations are given. The market at the East has been steadily declining during the past week.

COPPER—The market is reported unchanged. At the East, large holders are reported firm. Concessions are only obtainable from outside sellers. The *Iron Age* cablegram report is as follows: In copper there has been a large business, and prices, after declining somewhat sharply, turned for the better, with £5 7s paid for merchant bar prompts. The early decline was caused by dearer money and realizations by outsiders, There has also been considerable selling on "bear" account, but the market has received influential support the past few days. Consumers are buying moderately.

COAL—Imports the past week aggregate as follows: Swansea, 1840 tons; Nanaimo, 1268; Coos Bay, 1350; total, 4458 tons. Australian advices report the sailing of one or more vessels, and that other vessels are loading. Selling offers for January shipment are on the market at $8.75 without finding buyers. It now looks as if the local market has seen its worst. Had heavy rains set in early this month, prices would have been quite high, but the rain holding off so long has caused dealers to believe that it will not be advisable to put prices up, even if it does rain soon. Heavy shipments of coast coal are on the way to this port.

Mining Share Market.

Comstock mining shares held fairly steady on Thursday, Friday and Saturday, but since Monday the Gold Hill stocks have sold at lower prices in sympathy with a drop in Confidence of over 40 per cent. This is one of the usual deals that have been given of late years on Senator Jones' return from Washington. The Middle and North End stocks shaded off only slightly. Those in position to know affirm with the utmost confidence that an ore development was made in one or more of the Gold Hill mines a few months since, and that the depression in the market has been made to get in stock. Be that as it may, the lower prices have undoubtedly uncovered large lines of stock. Who bought, each dealer must be his own judge; but there is one thing quite certain: the public was too badly crippled to buy much. Several brokers were hurt by the decline, and to save themselves from ruin, had to sell considerable stock. Their selling kept the market down. It is claimed that with another 10 to 25 per cent decline, more stocks can be uncovered, but the question is, will manipulators by the decline lose more stock than they can gain? It looks as if persons who buy now and pay for the stocks and will not be alarmed if prices set off some more, will come out considerably ahead before the spring months. No sensible person will or should buy on a margin.

In outside stocks dealing has been confined chiefly to Bodie, which fell to 65c, then rallied some, but is again weak. A shipment of about $16,000 is expected from the mine. The mill has not shut down but is running smoothly. The Tuscaroras have held firm. Important development work is being done in Commonwealth, North Commonwealth, and two or three more of the mines. If the price of silver recovers, these stocks will come to the front as a good investment.

The two organs continue to keep Potosi as an object-lesson, as if the market hinged on it. It would be a surprise to the better informed if Potosi's shares do not make quite a break before long. Of course this depends on the success manipulators meet in selling stock. An assessment will have to be levied soon.

One of the most important events of the week was the interview had by a director in the Confidence Mining Co. with Francis G. Newlands. In the conversation Mr. Newlands expressed a wish to meet leading members of the Mining Stock Association, in order to talk over the mining situation on the Comstock, hear their complaints, and, if in his power, right the wrongs claimed to exist in mine management on the lode. Mr. Newlands no doubt has considerable opposition to contend with in bringing about any measure calculated to benefit stockholders, for he incidentally mentioned that a large owner in the Comstock Mill & Mining Co. seriously objected to the reduction of one dollar a ton in milling ores. This reduction Mr. Newlands made several months ago.

News from the Comstock mines is still hard to get—that is, for publication. We can affirm without fear of contradiction that the situation on the lode never promised better results for stockholders. The various works going on in the mines are nearing important objective points. In Hale and Norcross and Savage, important new crosscuts have been started, as there also have been in several other mines. From the outside mines the news is of a very encouraging character, with reports of new strikes in some of the Tuscarora mines. In the Quijotoa district, the mining news is encouraging. From the Bodie district the official letter received to-day reports that the mill will start up on the company's tailings. Some say that more bullion will be extracted from the tailings than from the ore when first milled. Active and important prospecting work is going on in the mine, as there is also in Bulwer. Private advices report an important strike in Bulwer. Perhaps that is why the Bodie and Mono stocks broke—to buy up Bulwer at lower prices.

Eastern Metal Markets.

By Telegraph

NEW YORK, November 20.—The following are the closing prices the past week:

	Silver in London	Silver in New York.	Copper.	Lead.	Tin.
Thursday	.47 5 16	1 02¾	$16 75	$5 12½	$20 90
Friday	47⅜	1 02¾	16 75	5 00	20 80
Saturday	47⅜	1 02	16 75	5 00	20 60
Monday	.46	1 00	16 50	4 95	20 30
Tuesday	.45	99⅛	16 50	4 85	20 10
Wednesday	.45	99⅛	16 50	4 75	20 10

NEW YORK, November 13. — BORAX is fairly steady. Quicksilver is dull and easy. Tin continues to set off, under lower prices for silver and money panic. The same cause affects copper, notwithstanding the statistical position is in favor of holders.

Coal and Coke.

SPOT FROM YARD—PER TON		TO LOAD—PER TON.	
Wellington	$14 00	Australian	$ 8 75@— —
Greta	14 00	Liverpool St'm.	8 50@— —
Carbon Hill	9 00	Scotch Splint.	8 50@ 9 00
Nanaimo	11 00	Cardiff	8 50@— —
Gilman	11 00	Lehigh Lump.	16 50@17 00
Seattle	11 00	Cumberland bk	13 50@— —
Coos Bay	11 00	Egg, hard	15 00@— —
Cannel	16 00	COKE—ENGLISH.	
Egg, hard	16 00	To load	$12 00@13 00
Cumberland, in sacks	19 50	Spot, in bulk	16 00@18 00
do. bulk	18 00	All spot quotations subject	
Wallsend	13 00@14 00	to change without notice.	

San Francisco Metal Market.

WHOLESALE.

THURSDAY, November 20, 1890.

ANTIMONY	— @ 21
BORAX—Refined, in carload lots	8 @ —
Powdered " " "	8 @ —
Concentrated " " "	7½@ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheathing	23 @ 25
Ingot, jobbing	20 @ —
do, wholesale	18 @ 18½
Fire Box Sheets	23 @ 25
LEAD—Pig	6 @ 6¼
Bar	6¼@ 6½
Sheet	7½@ —
Pipe	7 @ —
Shot, discount 10% on 500 bags Drop, ₱ bag.	1 90 @ —
Buck, ₱ bag	2 10 @ —
Chilled, do	2 10 @ —
QUICKSILVER—By the flask	53 00 @53 50
Flasks, new	— @ —
Flasks, old	45 @ 55
CHROME IRON ORE, ₱ ton	10 00 @— —
STEEL—English, ₱	16 @ 20
Clarton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. Y., steel grade, 14x20, to arrive.	— @ —
B. Y., steel grade, 14x20, spot	6 12½@ 6 25
Charcoal, 14x20	6 50 @ —
do roofing, 14x20	6 00 @ —
do, do, 20x28	13 00 @ —
Pig tin, spot, ₱ lb., nominal	23@ 24
IRON—Bar, base	3 @ 3½
Norway, base	4½@ 5½

	Spot.	To Load.
IRON—Glengarnock ton	34 00 @— —	30 @ —
Eglinton, ton	34 00 @— —	30 @ —
American Soft, No. 1, ton	— — @32 00	30 @ —
Oregon Pig, ton	— — @33 00	— @ —
Puget Sound	34 00 @— —	— @ —
Bar Iron (base price) ₱ lb	— @ —	— @ —
Clay Lane White	— @28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Langloan	34 00 @— —	30 @ —
Thorncliffe	34 00 @— —	30 @ —
Gartsherrie	34 00 @— —	30 @ —
Barrow	34 00 @— —	30 @ —
Thomas	33 00 @— —	— @ —
Cargofleet	30 00 @— —	26 @ —

Sales at San Francisco Stock Exchange.

THURSDAY, Nov. 20, 9:30 A.M.

150	Gould & Curry	150	1.70
5	Alta	50	1.10
50	Andes	100	25c
125	Belcher	400	1.30
100	Belle Isle	100	35c
100	Best & Belcher	200	1.00
150	Bodie	200	1.65
100	Bullion	50	20c
50	Bulwer	300	20c
100	Caledonia	50	6.87½
100	Chollar	240	2.00@2.10
50	Con Cal & V	200	1.10
200	Con New York	300	2.05
10	Confidence	50	35c
50	Crown Point	60	2.10
200	Del Monte	200	70c
50	Exchequer	250	55c

Patent Hoop-Clamp for Tanks.

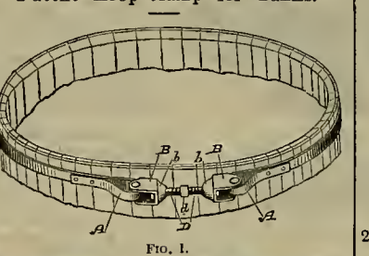

FIG. 1.

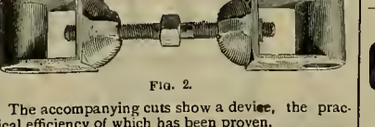

FIG. 2.

The accompanying cuts show a device, the practical efficiency of which has been proven.

A in Fig. 1 are the hoop ends, which are looped around the cylindrical outer ends of the heads *B*. The inner or adjacent ends of these heads are formed with hemispherical seats *b*, and in these are fitted hemispherical nuts at liberty to move in their seats.

D is the adjusting or tightening bolt of the clamp, having one end provided with a right-hand thread and at the other end with a left-hand thread, and at the center with a collar or wrench-hole, *d*. The threaded ends of this bolt pass freely through elongated apertures in the seats of the head and are connected with the hemispherical nuts in the sockets. An enlarged view is shown in Fig. 2.

The operation of the clamp is as follows: The ends of the hoops are looped around the heads as shown and then a wrench is applied to the central collar, *d*, of the tightening bolt. The bolt is turned and as its reverse threaded ends work in and through their respective nuts the heads are drawn together, thereby tightening the hoop. The strain being in a curve, deflects the heads from a straight line, the hemispherical nuts through which the bolt passes turning in their hemispherical seats in the proper direction to enable the clamp to conform itself to the curvature of the hoop, thereby exerting its strength in the line of said curve instead of in a straight line tangential to it. As before mentioned, the nuts will remain steady in the direction of rotation of the bolt.

This invention supplies a great want, particularly in dry and hot climates, where shrinkage of lumber is considerable. No device heretofore in use for the purpose of tightening hoops has been satisfactory, for the reason that the draft was not straight and therefore not direct on the hoops. The advantage of a clamp hoop over a riveted hoop, particularly in heavy tank work, must be apparent to all. To tighten a riveted hoop requires tools, scaffolding and capable men. It also mars the paint and injures the iron. To tighten with a clamp, working freely, requires simply a ladder and a wrench in the hands of anybody.

Clamp bands are convenient in transportation; heavy bands for large tanks can be handled in sections without folding. Mechanically considered, the device may be described as a right and left draw buckle, acting on ball and socket joints. It therefore works equally free, powerfully and effectually on long or short draft and on large or small circles.

The device has proved a great success and is now being used extensively in the tank-building department of Wells, Russell & Co., Mechanics Mills, cor. Mission and Fremont Sts., S. F.

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ASSESSMENTS

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Baker Divide & M Co	California	18	20	Nov 17	Dec 8	D M Kent	330 Pine St
Confidence Silver M Co	Nevada	17	75	Nov 17	Dec 22	Jan 12	A S Groth	414 California St
Con Imperial M Co	Nevada	29	5	Oct 15	Nov 15	Dec 8	C L McCoy	331 Pine St
Con New York M Co	Nevada	4	15	Nov 12	Dec 17	Jan 6	C E Elliott	309 Montgomery St
Goletta M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent	330 Pine St
Gray Eagle M Co	California	20	6	Oct 20	Nov 24	Dec 15	J M Buttington	303 California St
Guasucaran & Cal M & M Co	Honduras	3	10 00	Oct 28	Nov 28	Dec 16	Edward Oliver	22 Michigan Ave, S F
Hale & Norcross M Co	Nevada	96	50	Oct 7	Nov 12	Dec 3	A B Thompson	309 Montgomery St
Mexican G & S M Co	Nev da	41	25	Oct 18	Nov 20	Dec 10	C E Elliott	309 Montgomery St
Mono G M Co	California	30	25	Sept 18	Oct 18	Dec 2	B L Burling	309 Montgomery St
Montecito M Co	California	1	10	Sept 16	Oct 27	Nov 24	D M Kent	330 Pine St
Morgan M Co	California	14	10	Oct 30	Dec 6	Dec 29	L C Bresse	230 Montgomery St
North Peer G & S M Co	Arizona	6	5	Oct 1	Nov 5	Nov 25	Henry Deas	309 Montgomery St
Northwestern G & S M Co	Br Columbia	1	5	Nov 12	Dec 19	Jan 13	E Bonacina	438 California St
Russell Reduction and M Co	California	7	5	Nov 17	Dec 8	J Morizio	328 Montgomery St
Sterling M Co	California	1	6	Sept 16	Oct 27	Nov 24	D M Kent	330 Pine St
Seg Belcher & Mides Cons Co	Nevada	7	25	Oct 7	Nov 10	Dec 1	E H Holmes	309 Montgomery St
Silver Hill M Co	Nevada	27	20	Oct 8	Nov 13	Dec 3	D C Bates	309 Montgomery St
Trinity River T & M Co	California	3	30	Oct 6	Nov 17	Dec 8	Edwin L Grimth	28 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F	MEETING	DATE
Kentuck M Co	Nevada	J W Pew	310 Pine St	Annual	Nov 26

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	Gale	509 Montgomery St	25	Aug 22
Comstock Mill & M Co	Nevada	R R Grayson	331 Pine St	20	Nov 20
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Nov 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Oct. 30.		WEEK ENDING Nov. 6.		WEEK ENDING Nov. 13.		WEEK ENDING Nov. 20.	
Alpha	1 80	2.15	1.75	1.95	1.50	1.80	1.10	1.40
Alta	1.40	1.45	1.40	1.45	1.15	1.40	.90	1.25
Andes	2.00	2.45	1.70	2.10	.85	1.60	.80	.95
Belcher	2.75	3.10	2.70	2.95	2.20	2.65	1.80	2.20
Best & Belcher	3.35	3.60	3 10	3.30	2.70	3.30	2.35	2.75
Bullion	3.06	3.20	2.95	3.40	2.70	3.25	2 15	2.60
Bodie Con	2.25	2.55	1.95	2.30	1.10	1.90	.65	1 25
Bulwer	.45	.55	.40	.50	.30	.45	.20	.40
Commonwealth	2.60	....	2 65	....	2.50	2 85	2.50	2.65
Con. Va. & Cal	4.40	4.75	4.20	4.50	3.60	4.4	3.35	3.85
Challenge	2.30	*3.00	2.90	3.10	2.60	3.25	2.10	2.60
Chollar	3.15	3.40	3.00	3.30	2.25	3.60	3.35	3.80
Confidence	7.00	....	7.00	7.35	7.00	7.35	4.25	6.75
Con. Imperial	.35	....	.35	....	.25	.35	.25	.30
Caledonia	.45	.5	.45	.50	.35	.45	.25	.30
Crown Point	2.60	2.90	2.55	2.75	2.2	2.55	1.65	2 20
Crocker	.35	.40	.30	....	.25	.30	.20	....
Del Monte	.80	....	.70	....	.55	.60	.60	.70
Eureka Con	3.50	4.00	4.00	....	3.50	4.00	3.50	....
Exchequer	1.25	1.45	1.15	1.30	1.0	1.2	.70	.95
Grand Prize	.35	.40	....	....	.30	....	.25	.30
Gould & Curry	2.30	2.45	2.20	2.30	1.95	2.30	1.55	2.00
Hale & Norcross	1.90	2.10	1.80	2.00	1.75	*2.40	1.95	2.20
Julia	.30	.35	.25	....	.25	.30	.15	.25
Justice	1.60	1.5	1.45	1.50	1.35	....	1.05	1.25
Kentuck	1.95	2.2	1.80	2.05	1.65	1.90	1.10	1.45
Lady Wash	.40	.50	....	....	.35	.40	.30	.35
Mono	1.15	1.40	1.00	1.25	.65	.85	.40	.65
Mexican	3.10	3. 5	2.85	3.05	2.50	2.95	2.15	2 50
Navajo	.40	.45	....	....	....	....	.30	.40
North Belle Isle	1.45	1.60	1.45	1.50	1.35	1.50	1.10	1.30
New. Queen	.65	.90	.9	....	.85	1.10	.65	.90
Occidental	1.75	2.05	1.76	1.85	1.10	1.75	.90	1.15
Ophir	4.65	4.90	4.50	4.65	3.80	4.40	3.60	3.80
Overman	2.25	2.3	2.20	2. 5	2.00	2 25	1 65	1.95
Potosi	6.12	6.62	6.25	7.8	7.00	7.50	6.25	7.00
Peerless	.35	.40	.35	....	.30	....	.15	.20
Peer	.25	.0	.25	....	.20	....	.15	.20
Savage	....	....	2.85	3.10	2.35	2.95	2.00	2.40
S. B. & M	1.25	1.40	1 25	....	1.30	1.25	1.55	1.10
Sierra Nevada	3.05	3.4	2 95	3.15	2 30	2.95	2.05	2.45
Silver Hill	.20	.25	.20	....	.20	*.35	.25	.30
Scorpion	.25	....	.25	....	.25	....	.20	....
Union Con	2.90	3.15	2.80	2.90	2.20	2.80	2.05	2.30
Utah	1.15	1.30	1.00	1.10	.60	1.05	.65	.80
Yellow Jacket	3 20	3.30	3.00	3.15	2.45	3 00	2.10	2.50

* Assessment delinquent.

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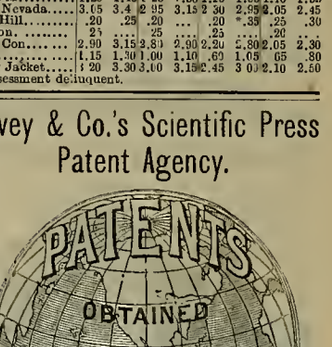

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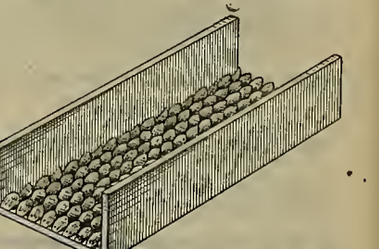
TRAFTON'S
Gold Saving Device.
Patented June 17, 1890.



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SITUATION WANTED—MINING ENGINEER, eleven years' practical experience smelting and milling, six years as Manager and Superintendent, desires employment. Just returned from Central America. Highest testimonials and references. Speaks Spanish fluently. Address, GRINGO, Box A, this office.

Assessment Notices.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Placer County, California.

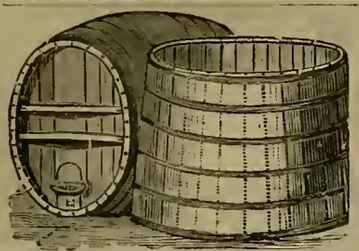
Notice is hereby given, that at a meeting of the Board of Directors, held on the 20th day of October, 1890, an assessment (No. 20) of Six Cents (6c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 11, No. 303 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1890, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 15th day of December, 1890, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W BARROWS, Secretary pro tem.

Office—Room 11, No. 303 California Street, San Francisco, California



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CALIFORNIA WINE COOPERAGE CO.

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ALL KINDS OF CASKS, TANKS, Etc.

☞ SHIP, MINING, and WATER TANKS a Specialty. ☜

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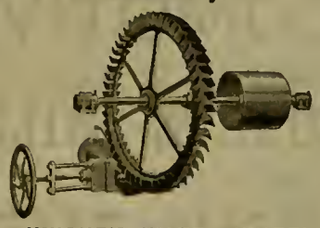
225 and 227 First St., San Francisco, Cal.

Compressed Air and Water Power Machinery.



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For Mills, Pumping and Hoisting.

OVER 300 IN USE.

All estimates guaranteed. Send for Circular.

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Ships under advances to smelting works in Boston New York, Baltimore and Liverpool.

Twenty-one years' experience in Shipping Ores and Managing Mines.

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Sales of Developed Copper Mines undertaken.

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RIFE'S HYDRAULIC ENGINE (or Ram)

PATENTED FEB. 8, 1887.

For Supplying Water to Small Towns, Factories, Steam Mills, Dairies, Stock Yards, Residences, etc., and for Irrigation, Railroad Tanks, Etc.

Constructed upon a new and improved principle greatly increasing the capacity and avoiding extreme concussion that has heretofore proved destructive to all common Hydraulic Rams, making this ESPECIALLY adapted to Railroad water supply and irrigation.

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Rife's Hydraulic Engine Manufacturing Company,

CAPITAL STOCK $50,000.

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Rock Drilling and Air Compressing Machinery

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And Wherever Ore and Rock are to be Drilled and Blasted.

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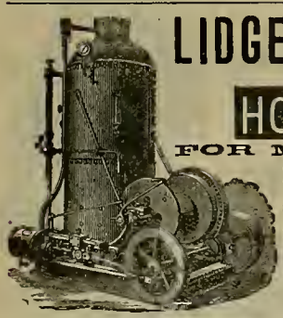

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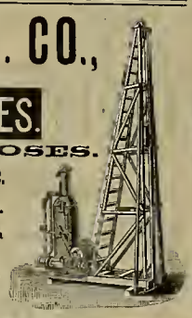

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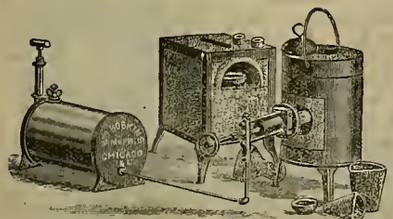
Chemists, Assayers, Metallurgists, Engineers, Jewelers, Dentists, Etc.



NO DUST! NO ASHES!

Portable! Practical! Automatic! Economical

Will do for every thing that a Coal Furnace or Gas Furnace will, and WITHOUT A-BLOWER.

Send for Price List and Descriptive Circular to

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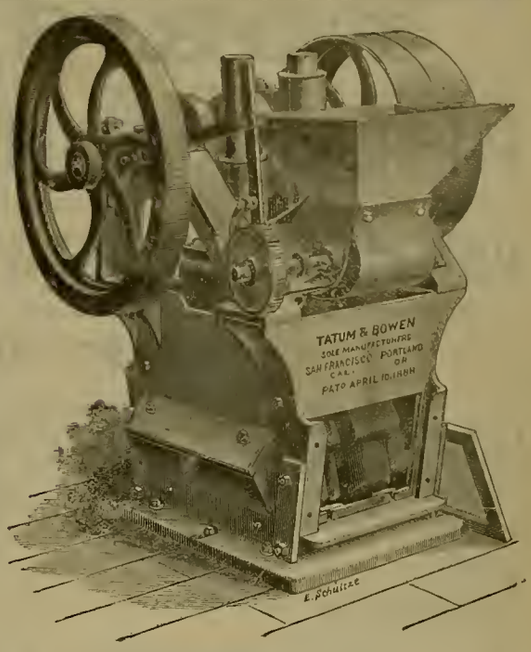
—THE—

PERFECTED DOUBLE Economic Quartz Mill.



Attached to each Mill is an effective

Automatic Ore Feeder.

RAILROAD FLAT, CAL., May 15th, 1889.

MESSRS. TATUM & BOWEN, San Francisco—GENTLEMEN: I have had many inquiries in regard to the performance of your oscillating Stamp Quartz Mill, to all of which I have made substantially the following answer:

That it will crush and discharge through a No. 30 mesh wire screen, 6 tons of average quartz per 24 hours; that, compared with the common stamps, the power required to do the same amount of work is considerably less—the slipping motion of the stamps reducing the ore much faster than the drop alone can; that the discharge is good, and as to amalgamating and saving gold, my experience with it is that it is just about the same as the ordinary battery.

To the above I shall add that the new Automatic Feed attached is a perfect success. It can, in a moment and without stopping, be adjusted to feed just as "high" or "low" as desired, and can be depended upon to supply the stamps with ore exactly as they need it. This is important, as it saves feeding by hand, which cannot be considered at the present day, or the purchase of a high-priced feeder.

Considered as a convenient Mill for prospecting, or for a small mine, it fills the bill.

Yours truly, [Signed] JAS. S. REYNOLDS,
Supt. New York Mine, Railroad Flat.

The Mills as we make them now are Far Superior to the one at the New York Mine.

TATUM & BOWEN,

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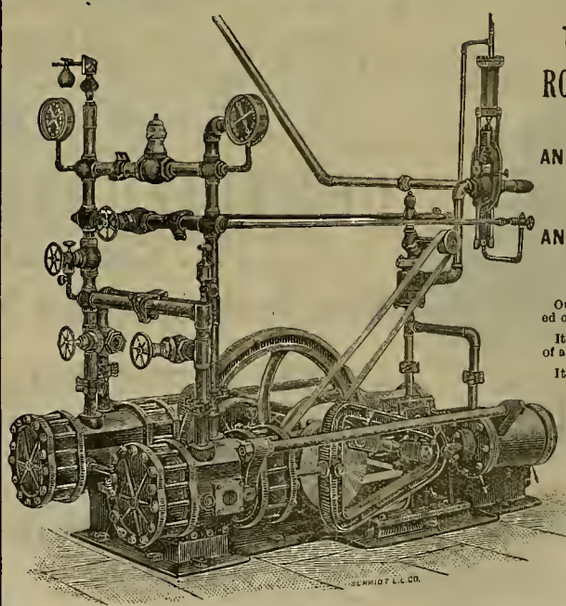

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Are manufacturers of

AN IMPROVED AIR COMPRESSOR

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Our Compressor is constructed on entirely new principles.

It weighs less than half that of any other of equal capacity.

It requires no Receiver.

There is no danger of overheating or freezing.

It is perfectly automatic in action.

Its first cost is less.

It saves in power required to run it from 25% to 50% over other systems.

It is especially adapted for running Pumps, Hoists, etc., etc.

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ADAMANTINE SHOES & DIES

FOR STAMP MILLS.

These SHOES and DIES are in extensive use in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited, subject to above conditions.

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— THE FOLLOWING CHOICE LOT OF —

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— COMPRISING THE ENTIRE PLANT OF —

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2 HAMILTON CORLISS ENGINES, 10″x30″, first-class condition.
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FULL SET PUMPING GEARS, Bob and Connections, Pumps, Column Pipe, &c. Lot of Steel Rails.

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8 FRUE CONCENTRATORS.
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5 STEAM PUMPS, 4000 FEET WATER PIPE.

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ALSO 12 FRUE CONCENTRATORS AT OUR WORKS. LOW PRICE. FIRST-CLASS ORDER.

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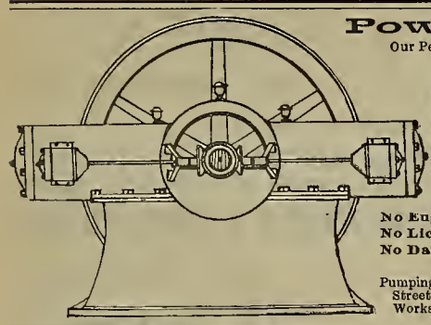

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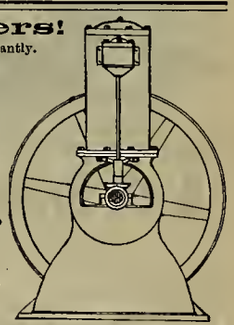

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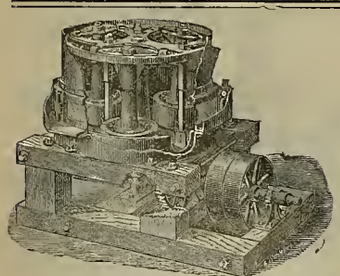

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Concentrators and Ore Crushers,

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FOR PULVERIZING ORES, WET OR DRY,

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Superior to all Others for Quartz Mills, Smelters, &c.

Not Affected by Wet, Steam, Heat or Oils. Every Belt Guaranteed. Try It. Send for Circular and Samples.

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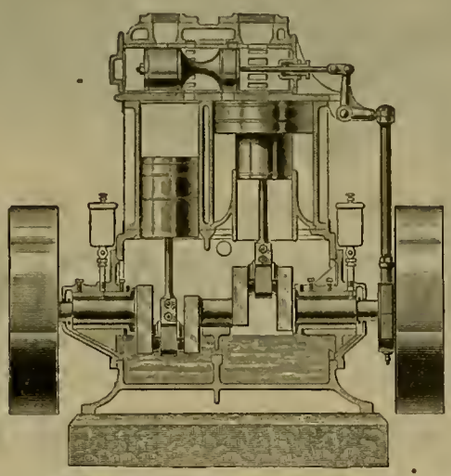
One Machine Taking Pulp from 10 Stamps.



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COMPOUND, 44 ENGINES, 5215 HORSE POWER. STANDARD, 99 ENGINES, 4500 HORSE POWER. JUNIOR, 166 ENGINES, 4260 HORSE POWER.

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AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates Replated, Bought, or Gold Separated. THOUSANDS OF ORDERS FILLED.

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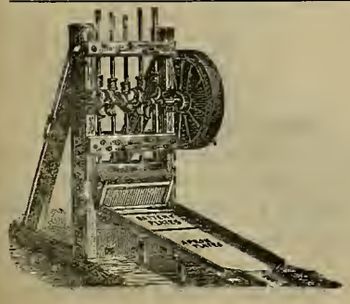

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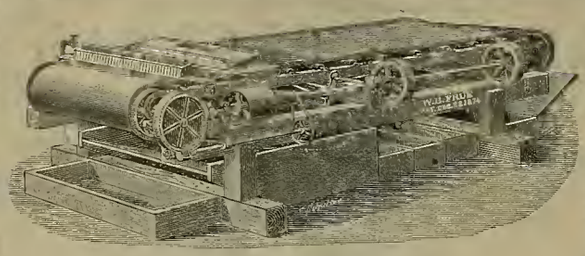

Price of Improved Belt Frue, $225, f. o. b.
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Protected by Patents December 22, 1874; September 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

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N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

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(INCORPORATED SEPTEMBER 29, 1882)

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Steam Pumps of all Makes,

CENTRIFUGAL PUMPS,

MINING PUMPS.

BLOWERS AND EXHAUST FANS.

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Stationary, Portable, and Hoisting ENGINES and BOILERS.

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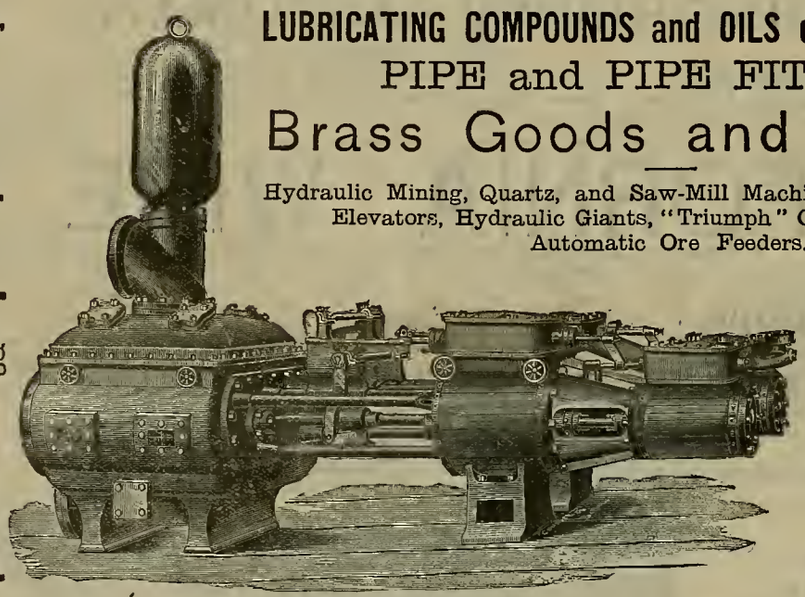

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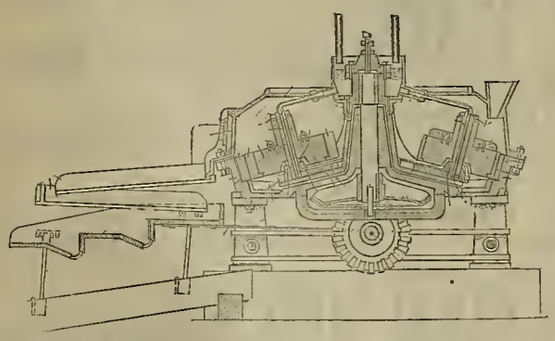

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Will crush from 15 to 20 tons of hard ore per day and from 25 to 30 tons soft ore. Lubricated by water only. Guaranteed to crush with least wear of any mill in the market.

ENGINES AND BOILERS

Steam Pumps and Irrigating Pumps

LAUNDRY MACHINERY,

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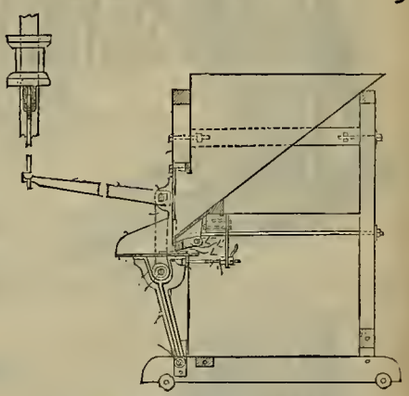
LEATHER AND RUBBER BELTING.

— AND —

SUPPLIES OF ALL KINDS.



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Will feed Wet or Dry Ore, for either Stamp or Roller Mills.

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258 Market St., N. E. cor. Front (up stairs), San Francisco. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential.*

COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

JAMES M. HAVEN. THOMAS E. HAVEN, Notary Public.

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MINING AND SCIENTIFIC PRESS.

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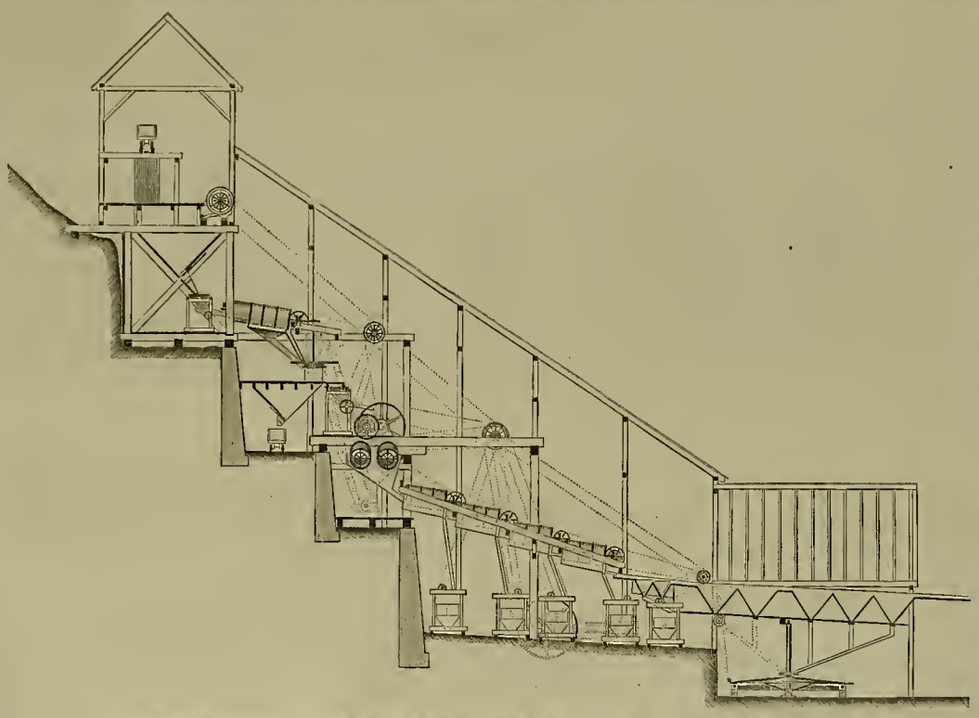
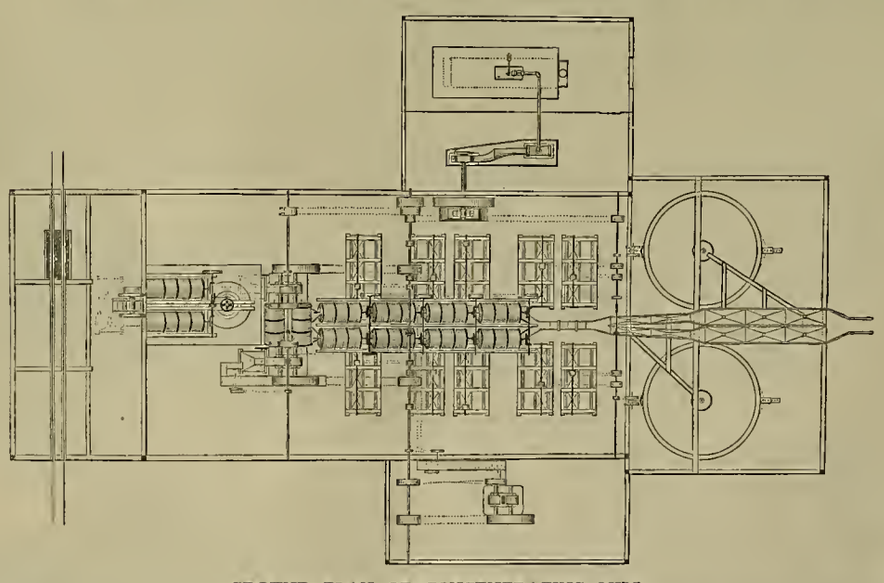
Concentrating Mill.

We illustrate on this page the general plan and arrangement of a concentrating mill for galena ores, it having a capacity of about 150 tons in 24 hours. The real beginning of concentration is in the mine, where by a rough hand-sorting the richer pieces of ore are separated from the poorer and the barren pieces. Further hand-sorting with spalling by means of hammers is often employed before the ore is subjected to any mechanical crushing. After the first crushing in rock-breakers, the ore, thoroughly washed and screened, is frequently again hand-sorted on revolving picking tables. Gradual reduction in size with intermediate screening out will generally prevent much unnecessary comminution of friable mineral and will throw the bulk of the work on the coarser jigs whose capacity is greater than that of the fine jigs. The middle products of the coarser jigs, whose capacity is greater than that of the fine jigs, can be crushed to a finer size and served to finer machines together with the rest of the fine material or can be treated on separate machines.



CONCENTRATING MILL FOR GALENA ORES, BUILT BY FULTON IRON WORKS.



GROUND PLAN OF CONCENTRATING MILL.

In the concentrator illustrated, the ore is brought in cars and dumped over a grizzly, which eliminates the portion finer than the intended crushing by the rock-breaker, to which only the coarser part is fed. The rock-breaker product drops into a bin terminating below in a self-feeder which supplies the wash trommels in a continuous and regular manner. The wash trommels are revolving drums about 8 feet long, the lower two-thirds of whose length consists of screens with 1 inch or 1½ inch openings. All material passing over this screen is guided through a discharge spout and on to the revolving picking table, where it is subjected to hand sorting, the richer portion being thrown through central apertures of the table into bins below, and from which it is removed as finished product. The poorer portion remaining on the table is removed by a fixed scraper and falls to the self-feeder, and thence into roughing rolls, which would be set to crush 1 inch or ¾ inch, depending upon the character of the ore. The material which passed through the openings of the screen on the wash trommels also goes to the roughing rolls if these are set to crush to a finer size than the screen, otherwise, together with roughing-roll product, the material passes to the trommels shown directly below the rolls. The screens in these trommels have openings of ⅜ inch or ¾ inch and determine the coarsest size of material to be worked on the jigs. The unscreened material from these trommels falls into an elevator which delivers it to self-feeders and thence into finishing rolls, which are set to crush to the mesh of the screens on trommels immediately below rolls. The screenings of these trommels, together with the crushed product of the finishing rolls, goes to a double line of four trommels which classify the material into four jig sizes, the end or over-discharge of the trommels being served to the eight jigs shown in plan. The screenings of the last and lowest trommels flow to a system of two hydraulic separators which separate the material into two sorts served to the jigs at each side. The overflow of the last hydraulic separator goes to the point boxes below which are prepared two sorts of material respectively for the buddles.

The middle products from the coarser jigs are diverted to the middling rolls in the room to one side of main plant for finer crushing, so as to further unlock the mineral in the mixed grains, after which they are raised by an elevator and sluiced to trommels, and thence again distributed to finer jigs. In large mills, separate trommels and jigs are often provided for this purpose. This, indeed, will be necessary in case different valuable minerals are to be separated from each other.

In some mills close sizing before jigging is not resorted to, and the jigs are called upon to handle a wide range of sizes. In some cases this is attended with good results, but generally the tailings require rejigging. For small plants close sizing and gradual reduction may be commercially inadmissible. All jigs require great uniformity of speed and water supply in order to do good work. All water pipes in a concentrator should be of ample size, so that the adjustment of supply to any machine will not affect that to another and disturb its work. The mill illustrated is taken from the designs of the Fulton Iron Works of this city, who are making a specialty of this class of machinery.

NEED NOT WORRY ABOUT THE RAIN.—Not because the fall rains have been delayed nor yet because the recent signs of their near advent proved disappointing, must it hastily be concluded that we are destined to see a dry winter. There are no unerring nor even tolerably reliable signs of either a wet or a dry winter in California. The fall of 1850, which preceded the driest winter of which we have any authentic record, acted much like the present one; yet this goes for nothing, in view of the fact that just such autumn weather has sometimes preceded our very wet winters, one of which may now be awaiting us just as likely as any other. We need not, therefore, borrow trouble about the prospective winter. Be it what it may, we shall not in this State with our much irrigated land and so much water stored in the mountains suffer any great shortage of either our gold, our grain or our fruit crops.

HOW IT WORKS.—Encouraged by that feature of the McKinley bill relating to the importation of lead ores, the smelting business throughout the central and the northwest mining regions has been greatly stimulated, new furnaces being erected and the idle ones everywhere started up; so also with the mines themselves. New claims are being opened and the old ones worked with greater vigor. With so much activity, miners are in demand and generally at enhanced wages, from $3 to $4 per day being the ruling rates paid.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Disposition of the Hydraulic Tailings.

EDITORS PRESS:—At Cherokee Flat, Butte county, where is located the property of the Cherokee Hydraulic Mining Company, can be seen what is called in mining phraseology a "grizzly," it being simply a contrivance for segregating the materials on a limited scale, as they come direct from the mine, and consists principally of long iron bars lying at the end of the first section of the flume as it emerges from the tunnel. Enough space is left between the bars for the water and finer pebbles and sands to pass through, but the coarse bowlders are shot out to the end of the bars, when they roll down into Sawmill ravine and there remain permanently. The water and pebbles after passing the "grizzly" are caught up by a flume and carried down a mile or so and dumped into the head of Dry creek. Here the gravel, sand, etc., spread out to nearly one-half mile in width—the finer particles being carried along Dry creek for a couple of miles to a dam located in an admirable place for storage, but not properly kept up to stop as much debris as it should, and from the dam the water and tailings is carried in a canal 25 or 30 miles to the low lands in Sutter county. The canal is 500 or 600 feet in width, with levees and sub-levees six or eight feet above the general surface of the low flat lands bordering either side of Dry creek.

The company saw early the trouble that the tailings from the mine was liable to make, so they bought the land along the line of the canal. It would probably have been better if they had in the first place avoided the line of Dry Creek slough and kept away with the canal line on higher ground, as it is now known that what materials the water contains will move readily in a canal eight or ten feet wide with a grade from five to eight feet to the mile. They would in this case not be troubled with the flood waters of Dry creek and the great expense of keeping up the levee lines. The principal point to be learned here is the ease with which the finer particles from the mine can be handled with a small canal. While in the present line the weeds and willows grow so thrifty in summer, when there is no water except from the mine, that it affords an obstruction and lodgment for the debris—the facts in this case being ocular demonstrations of points I wish to make use of. All hydraulic mines are not similarly situated, but modifications of the general plan below mentioned would have to be made to suit particular cases.

Most of the main hydraulic mines, of which nearly all are enjoined from working, are high up in the mountains. If, at the end of their main flume, they should continue their flume-grade until the vertical hight of the flume should be 50 to 100 feet above the ravine or creek channels, into which most all mines tail, then "grizzly" off all the rocks and gravels, as far as practicable, and which forms the largest proportion of the debris, and let it dump—the water, sands and gravel being caught in a flume and carried to some convenient point, where a reservoir of moderate dimensions could be constructed, when the second precipitation would be made of everything except the very finest particles and of least specific gravity. The latter could then be carried in a ditch until it met a ditch for a like purpose from some other mine, until one main ditch or canal would carry the materials to a settling reservoir of large dimensions. This would practically end the matter so far as the miner is concerned.

Now, for instance, take the case of the Yuba and Bear rivers, the combined tailings could be carried in a pipe over or under Feather river into the low tule lands in Sutter county, where the sediment would be in a few years a great help to the now almost worthless lands. To make a proposition like this practicable would require the concerted action of hydraulic miners, and also the laying out of a general plan for ditches and canals to subserve the purpose of the miners with the least outlay of capital and labor. O. M. ENSLOW, C. E.

Oroville, Cal., Nov. 20, 1890.

The Spring Attachment to the Huntington Mill.

Where It Can Be Seen in Operation.

EDITORS PRESS:—A correspondent in a late number of your paper makes some inquiry about the spring attachment to the Huntington Centrifugal Quartz Mill, patented through the agency of Dewey & Co.—your correspondent going on to remark that he has not seen any of those appliances at work, and wishes to know where there are any in use, how they succeed, etc. For the information of your correspondent and others who desire it, let me say they have one of the Huntington mills, with spring attachment, running on the Shaw mine near this place that has been in use for two years past, and with such manifest advantage that it is a matter of surprise to every one who has seen the operations that persons being this style of mill will consent to dispense with it. In working moderately hard ores, like those of the Shaw mine, this spring invention increases the crushing capacity of the Huntington mill fully 20 per cent, and prolongs the life of the steel roller rings double the time it would be without it, as the rings with this attachment wear perfectly round and smooth. Why this device is not attached to every Huntington mill built is something unaccountable, unless perhaps the builder of these mills does not own the patent for this invention, a matter about which I am not informed, though I presume the firm of Dewey & Co., through whose agency it was patented, would be advised as to this. I really think that not another mill of this kind should ever be allowed to leave the shop of the builder without this addition. HORACE F. TRACY.

El Dorado, Cal., Nov. 14, 1890.

Fortunes in Small Inventions.

Every little while the newspapers take up the subject of inventions and tell their readers how many have made fortunes out of small inventions. The Pittsburg *Dispatch* gave, the other day, a list of small things that have made their inventors wealthy. It commences with the pen for shading in different colors, which yields an income of $200,000 per annum. The rubber tip at the end of lead-pencils has already made $100,000. A large fortune has been reaped by a miner who invented a metal rivet or eyelet at each end of the month of coat or trowsers pockets to resist the strain caused by the carriage of pieces of ore or heavy tools. In a recent legal action, it transpired in evidence that the inventor of the metal plates used to protect the soles and heels of shoes from wear sold upward of 12,000,000 plates in 1879, and in 1887 the number reached 143,000,000, producing realized profits of $1,250,000.

A still more useful invention is the "darning weaver," a device for repairing stockings, undergarments, etc., the sale of which is very large and increasing. As large a sum as was ever obtained for any invention was enjoyed by the inventor of the inverted glass bell to hang over gas to protect the ceilings from being blackened, and a scarcely less lucrative patent was that for simply putting emery powder on cloth. Frequently time and circumstances are wanted before an invention is appreciated, but it will be seen that patience at times is well rewarded, for the inventor of the roller skate made over $1,000,000, notwithstanding the fact that his patent had nearly expired before its value was ascertained.

The gimlet-pointed screw has produced more wealth than most silver mines, and the American who first thought of putting copper tips to children's shoes has realized a fortune. Upward of $10,000 a year was made by the inventor of the common needle-threader. To the foregoing might be added thousands of trifling but useful articles from which handsome incomes are derived or for which large sums have been paid. Few inventions pay better than patented toys. That favorite toy, the return ball, a wooden ball with an elastic attached, yielded the patentee an income equal to $50,000 a year, and an income of no less than $75,000 fell to the patentee of the "dancing jimcrow."

The invention of "Pharaoh's serpents," a toy much in vogue some years ago, was the outcome of some chemical experiments, and brought the inventor more than $50,000. The sale of the little wooden figure, "John Gilpin," was incredibly large for many years, and a very ingenious toy known as the "wheel of life" is said to have produced upward of $100,000 profit to its inventor. One of the most successful of modern toys has been the "chameleon top," the sale of which has been enormous. The field of invention is not only vast and varied, but is open to everybody, without respect to sex or age, station or means.

PRESERVATION OF MINE TIMBERS.—The German Government officials, principally at the mine Altenwald, near Saarbrucken, have for 18 months past been experimenting to ascertain the best means to preserve and protect mine timbers, both from decay and from fracture by pressure. In connection with the tests to prevent decay of mine timbering, especially such as is exposed to great pressure, lime, coal tar, tar and carbolineum were tried in such a manner as to enable them to compare their relative protective value. The results show lime to be the weakest. Coal tar preserved the outside of the timber, while the core was found completely decayed. Carbolineum proved by far the best, and is now being used on all the timbering of the upcast in that mine. The mine timbers, made of wood peeled and dried, are twice painted over with the carbolineum above the ground, and require each, when 2.5 meters long and 0.25 meters in diameter, in the first application four-fifth kilogram, and in the second three-fifth kilogram, so that at a price of 34.5 pf. per 1 kilogram, the total cost was: For material, 48.3 pf., and for labor 14 pf., or altogether about 7½d. To prevent the premature breaking of the wall props, after experimenting for some time it was found that when three or four notches, 30 centimeters deep, have been sawed in the top part of the wood, this yields to the pressure by being compressed, but does not break.

THE Winchester Arms Co. of New Haven are to bore another artesian well. In a former attempt they went down 2250 feet without success, and they now propose to go until they get water.

The Gold Belt of California.

NUMBER III.

The Ancient Placers and Their Relation to Wall Rocks.

[Written for the MINING AND SCIENTIFIC PRESS by STEPHEN BARTON, Kernville, Cal.]

I have spoken of a belt one mile wide having yielded a large percentage of gold found in lumps worth more than $1000 each. The belt referred to would extend in length from the town of Sonora in Tuolumne county to the South Fork of the Stanislaus river, a distance of about eight miles. The largest body of gold found in a quartz matrix in this State was in the town of Sonora, at the south and lower end of this belt. The Strain lump was found in the immediate vicinity of the southeast corner of the corporate limits of the then city of Columbia. The piece found by Virgin, West & Co. was found about 40 rods west of the said corporate limits. North of where the Strain piece was found, in Three Pine Gulch, three pieces were found having an aggregate value of more than $12,000. This gulch rises in Summit pass, which overlooks the mining camp of Pine Log, on the South Fork of the Stanislaus. For 20 years there was seldom a week passed that there was not from one to several lumps extracted from this bar which weighed up in the ounces, and certainly more than one was found worth more than $1000 each. Here, on this little belt, was found at last from $28,000 to $30,000, which was in lumps above the size mentioned. The major portion of the underlying formation was lime throughout this whole region.

If this gold was produced in any other formation and was carried there by the current, then we should look higher up the stream for larger lumps. I have before mentioned that in this same lime formation a thin sheet of quartz was found rich in free gold. It may be mentioned further that in several places where there was a contact between lime and what was called "Block Ledge" (a rock too much decomposed for its character to be determined), several bodies of quartz in place carrying free gold have been developed in recent years.

I have called attention to the fact that in several mining camps in the middle and southern placers, the placer gold reposed on the same character of lime formation, and also to the further fact that this gold yielded a higher assay than gold obtained either to the east or west of this line; and to the still further fact that most of the placer gold of this region was dug above the mother lode. If we go to the Willard mine at Murphys on this same kind of a formation, we shall find the gold near the slate of the southwest wall almost chemically pure, while to the east 300 or 400 feet the bullion is by weight seven-eighths silver. In the Bonanza mine at Sonora there is much the most silver in the pockets found near the eastern wall. Now I have thought and have earnestly believed for years that such facts as those I have mentioned might lead us to look for the source of the gold of the ancient placers nearer home than was suspected, and might induce old miners to return and look over the ground again and enable all those who have acquired any knowledge of quartz to view the subject in a new light. With this end in view, I have undertaken the discussion of this subject.

(To be Continued.)

WHY PLATINUM IS GROWING DEARER.—Platinum jewelry is in danger of becoming a thing of the past. The amount manufactured this year is just about one-half of that of last year. For the last six months the price of the precious metal has been rapidly advancing, until now it has made an advance of over 60 per cent of the original price. The demand is greater than the supply, and in a short time the price will be out of the reach of every jewelry manufacturer. The advance is attributed to the large number of electrical works now in operation in the United States. The amount of platinum used in the manufacture of electrical apparatus is enormous. Each electric light contains about six inches of platinum wire, and if the metal is not pure it will not stand the great heat. As the electric light grows more in favor, the demand for platinum is greater, and unless some substitute can be procured, the chances are that platinum will be indeed a precious metal. Platinum is at present worth $14 an ounce, gold $20.70, and silver $1.04. The manufacture of platinum jewelry is more expensive than that of any metal. The ordinary heat of the blowpipe will not melt it, and it has to go through a process which is very expensive, and about 15 per cent is lost in the working.

THE attempt made by the geological survey of Texas to discover lead, zinc and tin ores in paying quantities has so far proven unsuccessful. In the Central mineral region a good many traces of all three ores have been discovered, but not in quantities which will pay to work either. More lead ore, a very fair galena, has been found than either zinc or tin. In Burnet county, on Beaver creek, lead ore has been discovered which assays 43.3 per cent lead. In Llano county two assays of lead ore show 43.34 per cent pure lead and 44.83 per cent lead. Of zinc and tin, only traces have been found, and not enough to justify an assay for it in other mineral specimens. The report of the State Geologist admits, however, that only the "Central Mineral Region" of the State has been worked and some portions of that in the most cursory manner. When all the mineral regions of the State have been worked by the men engaged in the geological survey of Texas, rich discoveries of these ores may be made.

The Amount of Money in Circulation.

The following interesting facts have been produced from the official statement of the United States Treasury Department:

In June, 1878, the population being less than 48,000,000, the money in circulation, according to this official statement, excluding the amount in the Treasury, was $819,201,372, or $17.21 per capita. In 1879 it was $832,355,060, or $17.03 per capita. In 1880 it was $978,770,337, or $19.51 per capita. In 1881 it was $1,119,813,843, or $21.76 per capita. In 1882 it was $1,179,103,651, or $22.33 per capita. In 1883 it was $1,236,301,823, or $22.83 per capita. In 1884 it was $1,243,115,836, or $22.38 per capita. In 1885 it was $1,290,844,522, or $22.61 per capita. In 1886 it was $1,249,489,329, or $21.39 per capita. In 1887 it was $1,317,214,868, or $21.58 per capita. In 1888 it was $1,371,101,722, or $21.84 per capita. In 1889 it was $1,380,405,561, or $21.38 per capita. Last March it was $1,437,216,124, or $22.11 per capita. On September 1, 1890, it was $1,436,062,942, or $22.44 per capita.

It can be seen from these figures that the amount of money in circulation to-day, excluding that looked up in the Treasury, the amount actually among the people in the channels of business, is greater per capita than for any year in the last 12 excepting 1883 and 1885, and it is further evident that the circulation has not materially decreased per capita at any point in this entire period, but has largely increased during the period as a whole, advancing from $17.21 in 1878 to $22.44 in 1890—or about 31 per cent. In other words, the increase of money in circulation is 31 per cent greater than the increase in population.

The statement by the Treasury Department was made up to September 1st. The increase in the circulation last month was unprecedented. Dun's report says on this point: "Never before has there been in any month so great an increase in the circulation or so large a payment of public debt as in the month just closed."

The figures given in this article are official and can be relied on.

Timber Supply vs R. R. Consumption.

The last Bulletin of Mr. B. E. Fernow, Chief of the Forestry Division of the Department of Agriculture, contains important and interesting statistics on the consumption of timber by the railroads. Before fully reviewing this important publication, the following points may be abstracted with profit:

In answer to circulars sent out to railways, it is found that the round total of timber ties in use on railroads in the United States is nearly 516,000,000, and 80,000,000 are annually required for renewals. Including bridges and trestle-work, the annual consumption of timber on railways is computed at 500,000,000 cubic feet, requiring the cutting of the best timber from over 1,000,000 acres of forest land per year. To meet this demand, under our present wasteful management of timber land, the area to be preserved for this purpose would probably exceed 50,000,000 acres, or more than 10 per cent of our present forest area.

As railway managers prefer "hewn" ties and "one to the cut from small trees," the timber consumed by railroads, or 20 per cent of the total annual consumption, is taken from the young growth. Then 60 per cent of all ties are oak, the most valuable of all our timber. Reliable investigation shows that in the Kentucky forests, where 40 per cent of the natural growth is white oak, the new growth of oak is only 5 per cent after the land has once been cut over for ties.

The consumption of pine from the forests of Wisconsin and Michigan is also enormous; and while some of us look to Canada for future supplies, Mr. Fernow points out that Canada, too, is becoming alarmed at the rate at which her forests are disappearing. At the Congress of the American Forestry Association, at a recent meeting at Quebec, Lieutenant Governor Angers, of Quebec Province, said that between 1867 and 1889, 69,600,000 cubic feet of wood were cut down in Quebec alone. In California, in 1889 it is estimated that $25,000,000 worth of timber was destroyed by fire, the greed of speculators, and the efforts of herdsmen to secure pasturage for flocks.—*Engineering News.*

Hoskins' Hydrocarbon Blowpipe and Furnace.

The above apparatus constitutes a very simple, compact, and at the same time complete outfit for the use of assayers, chemists, jewelers, dentists, etc. This plant is meeting with large sales. We are advised of the following recently effected:

Carny & Hand, assayers, Butte City, Montana, complete plant, including a 9x15 muffle furnace.

Butte Reduction Works, Butte City, Montana, two 9x15 muffle furnaces with large blowpipe complete.

Golden Leaf Mining Co., Bannock City, Montana, a complete outfit.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XXI.

[Written for the Press by James H. Crossman.]

Hieroglyphics on the Desert Food for the Archæologist and Ethnologist.

Having shown how, through the agency of the Silver Valley Land and Water Company's water scheme, a large portion of the Mojave desert can be rendered productive and habitable, we have, it would seem, sufficient evidence to prove that at a comparatively recent period, geologically speaking, this region of country contained a considerable population, and to support a population, there must necessarily have been vegetation. To say the least, we find here evidences of man's handiwork in the sculptured characters to be seen on the faces of a small porphyritic butte standing out on this desert and known as

HIEROGLYPHICS ON A PORPHYRITIC BUTTE IN THE MOJAVE DESERT.

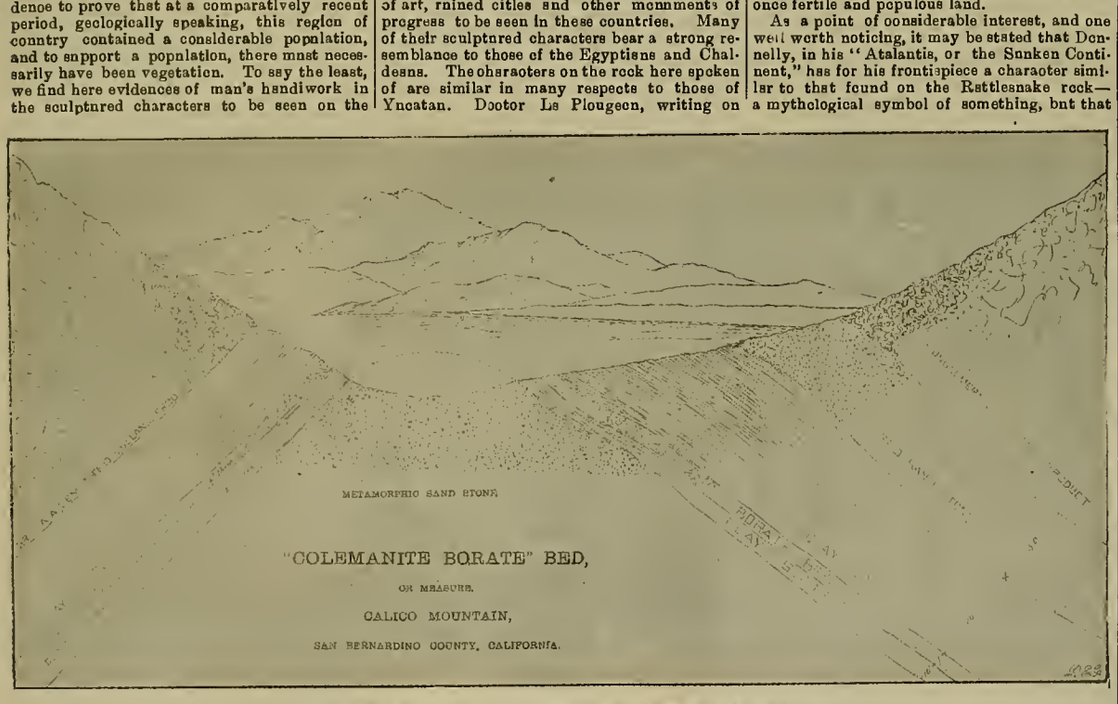
Rattlesnake Rock,

This name having been given it by reason of the immense number of these reptiles that find shelter in this mass of rocks. This butte is situated about two miles north of Daggett and 1½ miles east of the Waterloo mill, standing solitary and alone on the barren plains. It is seldom visited and but little known, not being on the line of travel. It was called to the attention of the writer by Mr. J. Alderley of the Waterloo mine. Visiting the spot, a sketch of the rock and the hieroglyphics engraved thereon was made—the same being represented in the cut herewith given.

The implement used in making these characters was evidently a dull-pointed stone, as the lines are not sharp and the sides of the indentation show marks of striation. That these characters are no erratic figures emanating from the brain of the stupid and ignorant aborigine of the present day, is very evident. They were formed by the hands of a superior race who had acquired the art of recording their ideas and history in symbols and characters, and who possibly may have been allied to the mound-builders that at a remote period populated the American continent from Lake Superior on the north to Bolivia on the south, Yucatan and Central America being the central point of this civilization, which must have been somewhat advanced, judging from the works of art, ruined cities and other monuments of progress to be seen in these countries. Many of their sculptured characters bear a strong resemblance to those of the Egyptians and Chaldeans. The characters on the rock here spoken of are similar in many respects to those of Yucatan. Doctor Le Plongeon, writing on the subject, states that the Mayas in Yucatan used many words and names common to all or nearly all the ancient languages of which we have any knowledge; that they used letters and characters belonging to the most ancient Chaldaic alphabet; and that their mode of writing was similar to that of the Babylonians. He even claims that the continent we live on was the cradle of the world's civilization. Other works of art also exist in this region which are equally as interesting as this sculptured rock.

About six miles from this spot, in a northerly direction, in the Calico range of mountains and two miles east of the town of Calico, an ancient tunnel has been driven into the hill through a granitic rock of a slaty structure for a distance of 180 feet. Some stoping has been done here and a shaft has been sunk at the month of the tunnel 30 feet in depth, the tunnel being 4½ feet high and 3 wide. The implements used in this work, judging from marks and abrasions on the rocky wall and roof, were stone hammers and gads of the same material. The mineral sought for was a peroxide of iron of a brilliant red color, which the people who performed this work undoubtedly used as a paint in decorating their persons and wares. Numerous well-formed stone mortars and pestles were found at the mouth of this tunnel, which was undoubtedly driven by the same race that recorded their history on this sculptured butte, but at a period anterior to the cataclysmic volcanic disturbance that destroyed both the flora and the fauna of this once fertile and populous land.

As a point of considerable interest, and one well worth noticing, it may be stated that Donnelly, in his "Atalantis, or the Sunken Continent," has for his frontispiece a character similar to that found on the Rattlesnake rock—a mythological symbol of something, but that is left for the archæologist to determine. The figure alluded to represents apparently the globe with a serpent or other huge reptile attached to or attacking it.



CROSS-SECTION OF "COLEMANITE BORATE" BED.

Borax Deposits.

On the southeasterly slope of Calico mountain there exists an extensive bed or measure consisting of several varieties of minerals, among others that known as Colemanite. This bed, which is situated seven miles in a northerly direction from the town of Daggett, lies between walls of slate which in turn are underlaid and overlaid by strata of sandstone—the diagram here introduced showing a cross-section of this deposit. This deposit is marked by smooth, well-defined walls—the underlay of the veins conforming to the irregularities of the footwall, while the overlying or hanging-wall is as smooth as the plastering on the sides of a hard-finished room. The color in some places is a pure white, in others a greenish or grayish color. At the point of development the strike is nearly east and west, dipping southerly into a spur of the mountain range at an angle of about 36 degrees. The slate and sandstone combined often attain a thickness of 80 feet. Above this formation is found a stratum of red sandstone, evidently indurated and discolored by heat. This is overlaid in turn by a brecciated eruptive material, evidently ejected from a water volcano. It contains angular fragments of a great variety of stone cemented into one solid mass by volcanic ash, lime and water. The boracic product contained in this vein or measure is crystalline and remarkably pure. Vugs filled with clear prismatic crystals occur, often containing in their centers pure, tasteless crystalline water. The main workings are located on the southerly and easterly slopes of the range and northerly slope of the spur. The vein takes a crescent shape as it follows the rim of the basin in which it occurs, similar to a bedded measure of coal. It measures on the cropping line 14,248 feet, with workings at intervals for this entire distance, with the exception of an intermediate space of 2178 feet, where the croppings are covered by debris and a volcanic brecciated cap. The property is owned and controlled by the Pacific Coast Borax Co., F. M. Smith president and J. W. S. Perry superintendent.

A cord drawn across the arc of the crescent (circle) would measure 11,880 feet.

Developments.

This vein-shaped measure has been well opened at many places on its line of croppings and systematically developed. The developments consist of costean pits, incline shafts, adit levels, etc., exposing immense quantities of the boracic product.

Here are seen large masses of pandermite of a snowy dazzling whiteness, then a Colemanite with its crystalline vitreous luster carrying prismatic crystals that sparkle in the sun like diamonds—showing all the hues of the solar spectrum.

The mine has been most extensively developed at a point near the center of the several locations, and consists of No. 1, No. 2 and No. 3 shafts—the deepest, No. 1, being 249 feet on the inclination of the lode. At this point, water makes its appearance. The main workings are west from shaft No. 3, from which stopes have been extended for 52 feet east. The vein has been stoped from the 211-foot level to the surface. Below this point for 38 feet no stoping has been done. The bottom of the shaft is in good ore, showing a 6-foot vein. Only 12 tons per day are raised from the mine, which is sufficient to meet the requirements of the market. The supply is practically inexhaustible. The mine is well handled by Foreman Perry.

The workings are thoroughly ventilated by longitudinal drifts and winzes connecting the three shafts which are 100 feet apart. The ore breaks easily and it requires but very few hands to supply the demand.

At a point 400 feet westerly from the workings described, the vein has been developed by an incline shaft at an angle of 45 degrees to a depth of 45 feet. Here the vein shows the same general characteristics as in shaft No. 1, in richness, structure, strength, strike, etc. At this point a singular phenomenon presents itself. Immediately across a dry ravine 110 feet distant northerly at a right angle, a vein occurs with a reverse dip of 45 degrees pitching northerly into the opposite hill as shown in the cross-section presented. It is difficult to account for this phenomenon, but it must have been caused either by a sinking of the earth's crust or the bedded measure when laid down must have conformed to the irregularities of the surface, which at that time was all submerged and covered by saline water; or if laid down horizontally, a local upheaval must have occurred at this point, causing a folding of the strata.

The crude boracic product is hauled to Daggett by a 14-mule team carrying from 10 to 12 tons to the load, making usually two trips in three days. The product is shipped to San Francisco by rail and refined at the company's refinery in Alameda.

In my next article I shall have something to say of the Comstock of the South (Calico mountain) and its immense belts of argentiferous ore. Calico mountain is like a sponge that has been thoroughly soaked with water. A large portion of the northerly slope of the range has been so thoroughly mixed with a solution of silver that it is extremely difficult to select any portion that by assay would not show a trace of that metal. That portion of the metalliferous rock that lies in bands, belts and veins, will in the future prove largely remunerative to the mine-owner. It is a well-known and understood fact that Calico has been self-supporting from the start. She has neither asked nor received capital from the outside world, and has made many men moderately rich. The ground was at first believed to contain a system of blanket deposits; then by some of our scientists the defined veins were dubbed cracks in the earth's crust; but continued working and deeper explorations have demonstrated that both vein and ore have been continuous in depth as well as longitudinal extent.

(To be Continued.)

Another Comet.—Tona, at Palermo, discovered a bright comet on the 15th instant.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

ON THE MOTHER LODE.—*Ledger*, Nov. 22: Ten stamps of the mill of the Amador gold mine were started last week on ore from the Doyle claim, which is close to the mill. It is the intention to run through 500 or 600 tons, so as to secure a fair test crushing. The ore is said to look well, and the prospects are considered very favorable for a paying yield. Should this rock come up to expectations, it will be a big thing for that section, as there is a large ore body in sight and it can be worked very cheaply. The mill at the McKenzie mine, Irisbtown, has been shut down for several days, owing to the repairing of the flumes of the Volcano canal, which is the source of the water supply. The mill is fixed up to run by steam but they have no wood on hand to enable them to run. At the mine, sinking operations are being prosecuted. At the Gardiner property the mill is kept running steadily on rock from the Union claim, which is thought to be of paying grade. We are unable to give the exact results, everything pertaining to the output of hullion being kept quiet. At Plymouth the mining interests continue depressed. The Plymouth Consolidated employs only a few men in prospecting. The New London is low-grade rock, and is just about paying expenses. At the Clinton Peak the tunnel is in 350 feet. Three veins or small seams of quartz have been encountered, one of them over two feet wide and showing free gold and good-looking sulphurets. The main ledge, however, is believed to he considerably farther in the hill.

Butte.

PAYS BEYOND EXPECTATION.—Chico *Enterprise*, Nov. 21: From several gentlemen over from Oroville last evening we glean the following interesting items of the famous Golden Gate mine near tbere. The whole town of Oroville is wrought up on the subject and golden fancies flit through the minds of every denizen of that booming hurg. There is evidently a hig thing in the above mine and the people believe and the owners know it. Visitors are now prohibited from going into the mine, except to the dam and the end of the flume. Five hundred men have finished the stripping and are now at work on the strictly mining part of the affair. The gravel is paying far better than was at first supposed; on the surface it yielded 25 cents a pan and a little lower tbis increased to $1, with seemingly no present bottom to the richness until bedrock is reached, when $5 to the pan is expected to be realized. Every clear day before the rains set in will he worth a vast fortune in itself, for with 500 men at work and every shovelful of dirt worth a dollar, it is calculated that $500 a minute is thrown nut. It is now predicted that the sum of $10,000,000, which was promised the shareholders, will reach $15,000,000. This stupendous sum taken out of the earth is almost enough to revive the old-time mining craze, but when it is remembered that almost a million dollars was sunk in the project before anything was in sight, the average man will hesitate before going gold-hunting. The presence of so much wealth, and such a number of men in proximity to Oroville, means prosperity to that place, and we trust her citizens will reap a just business reward.

El Dorado.

RUSSIAN DIGGINGS.—*Democrat*, Nov. 22: S. A. Lane is still pushing his tunnel ahead at Russian Diggings, with excellent prospects; his men are working with right good will and hurrowing like beavers to get the tunnel driven as far into the bill as possible before cold weather sets in.

BLAIR GRAVEL.—Considerable work is being done at the Blair gravel mine. A boarding-house and lodging-house are being erected, and as soon as they are ready for occupancy a force of men will be employed to dig a tunnel.

THE VAN MINE.—Supt. Newlands, the millwright and force of mechanics and miners are pushing ahead work on tbe Van mine, a short distance north of town. The ground for the Huntington mill has been graded, the mill and machinery is on the ground and most of tbe lumber. The work of sinking has been begun, and the 600 feet of eight-inch pipe, with 125 feet pressure, will be laid in a few days. The building will cover a space about 25x80 feet. If the 20-foot lode holds out in depth, it will he one of the largest mines in the county, and at least tbree more Huntington mills added.

Inyo.

READING CANYON. — *Independent*, Nov. 14: There are excellent mining prospects in Reading canyon. The place is in tbe Inyo range about six miles south of Bishop Station on the C. & C. road. There is a switch near the mouth of the canyon. Last Saturday A. R. Jones struck a ledge of fine ore, and so far there appears to be a hig body of it. O. H. Hill, proprietor of the Valley View hotel at Bishop, and other parties interested with him, have been operating in the canyon for several months past. They have worked a good deal of ore in an arastra, and the yield has been $90 per ton. The ore contains much sulphurets and this causes heavy loss of gold, tbe tailings, hy repeated assays, showing from $40 to $60 per ton. A few days ago Mr. Hill brought several carloads of ore down to the Maxim mill and is now having it worked there. Mr. Hill says that even with the heavy loss in the tailings they have a good thing in their claim. There is much probability that a mill may be built near the mouth of Reading canyon. Water from the McNally ditch is offered free and also a tract of five acres for a yard and buildings.

IN SALINE VALLEY.—Messrs. Conn and Trudo were at Independence some days this week. They bave applied for patents for over 1200 acres of land in Saline valley; 160 acres of this is a pre-emption and the remainder is horax land.

Plumas.

THE JAMISON MINE.—*National*, Nov. 15: This property is located in the Quartz Mountain district, two miles south of Johnsville, at an altitude of over 5000 feet above the sea level, and adjoins the Plumas Eureka on the north and west. The property comprises several valuable locations upon which there are three distinct ledges, known respectively as the Jamison, Bosco (Soutb Eureka) and Nevill. The course of the vein is north and soutb, dipping easterly at an angle of 75 degrees. The ledge matter between walls has an average width of six feet. The property has been opened by a tunnel following the vein into the mountain about 400 feet, showing a pay chute of ore tbe whole distance. A large quantity of tbis rock has been taken out and worked by the arastra process, which yielded on an average of $8 per ton free gold. The vertical depth from surface reached in tunnel is 60 feet, the present intention of the company being to run the tunnel a distance of 500 feet and sink a shaft. The character of the walls is similar to the Plumas-Eureka—that of the hanging-wall syenite and footwall metamorphic slate. The entire formation, pitch of ledge, formation of walls and general character of the ore are identical with considerable of the rock extracted from the Plumas-Eureka. The mine is situated on Little Jamison creek, a tributary to the Jamison, from which source the Plumas-Eureka obtain their supply. The property was formerly known as the Little Jamison, and in order to open the mine thoroughly and place it among the producing mines of the county, the property was incorporated on Jan. 19, 1887, under the laws of the State. Since the company began operations a large amount of work has been done A flume 1000 feet in length has been constructed from head to outlet for the purpose of carrying the waters of Little Jamison creek, which at the present time flow over the mine. It is 72 feet wide with a fall of 12 inches in 16 feet. The capacity of the flume is sufficient to carry all the waters in the creek. The company has an unlimited supply of water, comprising four natural lakes, the highest being situated at an altitude of 6367 feet. The water is conveyed by a ditch (capacity 1000 miner's inches) 1¼ miles to the mine, giving a pressure of 507 feet, sufficient for all practical purposes. A large number of buildings have been erected upon the property.

Placer.

SOUTH YUBA DITCH.—*Republican*, Nov. 19: The South Yuba Company has a few men working on the old ditch at Gold Run and at other points along the line of the ditch that is to he enlarged and extended in the spring. George Morgan has uncovered $600 in the shaft of his mine on Duncan Hill. The shaft is down about 30 feet.

San Bernardino.

EFFECTS OF THE SILVER LAW.—Colton *News*, Nov. 21: The mining industries of this county took a boom immediately upon the passage of the silver bill which directed a less limited coinage of silver, and if the Republicans will, during the expected extra session of Congress, pass another bill which will provide for the free coinage of the white metal, this important industry will at once leap to the front rank where it belongs.

Shasta.

BALAKLAVA MINE.—*Democrat* Nov. 19: This property, one of a group known as the Windy Camp mines, owned by B. Conroy, Willard & Weil, A. C. Ellis, Billy Murray and others, was bonded Monday to a Milwaukee syndicate of capitalists who, we understand, made a handsome first payment, which shows that the purchasers mean business. We are also informed that the new company are large smelters, and will immediately commence extensive development work on tbe mine, which is already quite well developed with prospecting shafts, tuonels, drifts and crosscuts. The agents who made the purchase are experienced mining men and smelters, and examining this helt of refractory ore, said they were greatly surprised at the extent of the ore deposits. We predict that this sale is the forerunner of a great mining boom in this county, for if this company succeeds in their undertaking, it will cause the development of that whole belt of gossan ore between Squaw creek and Iron mountain, which we verily believe is the making of a second Comstock.

EXAMINING THE MINES.—Quite a number of mining men from abroad have been running and out to the mines in this county for the past two weeks, making Redding their headquarters. Three of these parties seem to be making a thorough examination of mining properties for sale in the county, and we will not be surprised to hear of one or more big sales soon. Just now mining property is engaging the attention of capitalists from every direction.

VARIOUS OTHER MINES.—The Trinity Mining Co. have their ten-stamp mill well under way. The cluster of mines north of the Trinity will most likely be sold in a short time to San Francisco parties. The Trinity Co. is the first to erect a stamp-mill on Dog creek. A young miner by the name of Bucher is taking out some very rich rock on a blind lead he discovered this year west of Sbasta. The vein is a strong one, well defined, and yields ore that will mill from $150 to $200 in free gold. It is considered one of the most promising prospects in the county. The new machinery at the Eureka Tellurium Co.'s mine on Middle creek will be in running order in a few days. The company will do some extensive work in this mine this winter. The Central Mining Co. of Old Diggings will let a contract this week, so we are informed, for running a 600-foot tunnel on the Central. A lot of new machinery for the Calumet mine arrived here Saturday night and is being hauled to the mine.

MINES ABOUT DELTA.—*Free Press*, Nov. 22: Mr. Champion, owner of the Carter & Coyle mine at Delta, reports a tunnel 300 feet long tapping a four-foot ledge, rich in free gold and sulphurets, 120 feet below the earth's crust. The ore averages about $65 to the ton. He also owns five other properties which are partially developed. The ground is leveled for his new ten-stamp mill and all the machinery is on the ground. He expects to he running by December 1st, water being the power employed. He has on band 500 tons of ore taken from the tunnel while driving ahead. Forty men are employed and a tramway 2000 feet from the mine to the mill will be soon completed. Mr. Champion has also erected a $2000 residence which alone shows his confidence in the Delta mining property. The Ballaklala mine has been bonded by Eastern capitalists who will proceed to develop the property. There is no reason why this mine should not pay as well as the Lost Confidence at Iron Mountain. The Gold Chest Mining Company of Trinity county are running a deep tunnel to tap their ore chute 150 feet deeper than the present level. Mr. Whittier of San Francisco, a wealthy owner in this mine, thinks more of it than any contract he ever had. We are informed that the Thomson mine, in the Lower Springs district, will resume operations about December 1st. A three-foot ledge, laid bare a month ago, gives promise nf plenty of ore rich in sulphurets. The miners of Lower Springs district propose holding a meeting in Shasta to-night to protest against the encroachment of agricultural settlers. Pete Scberer is actively engaged in getting matters in shape for extensive work on the tellurium mine this winter.

Sierra.

MINING ITEMS.—*Mountain Messenger*, Nov. 22: J. B. Moulton, Chas. Binning, Mr. Matheson, O. Scheffer and Robt. Evans are working at the Hardscrabble drift mine, formerly known as the hospital ground of the Bald mountain. Very hard rock in Young America tuonel, only a foot a day made, obliging contractors to throw up the job. The South Fork Co. is running its main tunnel with two shifts, and expects to reach bedrock 400 or 500 feet ahead. Cornelius Redding is still running a tunnel about a quarter of a mile below Forest City, where he has been at work for the past three years. Work has been in progress for the past three months at the Arizona claim. A shaft will be raised for gravel in the spring.

Siskiyou.

MORE QUARTZ-MILLS.—*Telegram*, Nov. 22: Ed Sheffield, at the head of White gulch, about five miles from Sawyers Bar, is grading and otherwise preparing ground for the erection of a larger quartz-mill than the one he bas heretofore used. It will be located lower down than the present one, so as to afford more water and greater pressure, and will be run all the year round. Frank H. Hall of Etna passed through Yreka yesterday on the road for San Francisco, where he will remain for two weeks, during which time be will purchase two large hydraulics, besides a large amount of other machinery for the new mines which are now being opened up in the Salmon river country. He reports the mining outlook in that locality as being more rosy-hued than for years. R. L. Fogundez, from the Salmon river country, was in Yreka the forepart of this week. He says that the Gold Ball Company are putting four more stamps in their mill, and that his own mine is giving employment to six men, and still producing good results.

ROBBING THE SLUICE-BOXES.—We hear of frequent complaints from the Klamath river of the cleaning-up of the miners' sluice-hoxes by Chinamen. We are informed that at Beehee's mine, a couple of weeks ago, it was estimated that about $800 was stolen in this manner. A couple of these night owls were arrested and brought to Yreka last week.

Trinity.

CANYON CREEK.—*Journal* Nov. 22: Last week we spent a few days on Cañon creek and found matters progressing in that camp. Shattuck and Grigsby bad their mill ready to run and expected to crush ore this week. The force at the Bailey mines was building a good, substantial cabin and making other preparations for the winter. The Globe Company have shut down for the winter; they have a splendid prospect. The Fisher Gulch Company bad their mill and water-wheel set up and geared. This week the company will lay 213 feet of pipe and put in sluice-hoxes and will then be in position to take advantage of the first water that comes. All the outside work now remaining to be done on the property consists in digging a short road from the mine to the mill and putting up an ore-bin. The ground is favorable and it will not take long to dig the road. The coming winter will show more concerning the Cañon Creek mines than has yet been ascertained. With two mills in operation the ore can be subjected to the only correct test—a mill test. It is the opinion of all acquainted with the country that Cañon creek has a bright future and in a short time will rank with tbe best camps of Northern California.

Tuolumne.

BUT LITTLE DOING.—*Independent*, Nov. 22: At present there is very little doing in mining circles, despite fine weather and plenty of water. The Golden Gate is the only mine that is doing much, while the Sanguiseppi holds its own. The Stanislaus gravel mine seems to he dragging along, with a great deal more gravel than gold. The Dead Horse and Black Oak are both doing nothing to speak of, and the Buchanan not much. The pocket miners are doing very little. The Old Colby claim, and the Oliver and Oaks claim on Saw Mill Flat, are operating vigorously, but there is no gold in sight. The Bonanza paying vein petered, and for over a year nothing has been realized by its operators, but during which time over $30,000 has been expended.

Yuba.

DRIFT STRIKE.—*Appeal*, Nov. 20: A rich strike has been made in the Ayer drift mine at Smartsville. It is owned by the Excelsior company and is under the management of W. J. Stewart. This development is said to be one of the best ever made at Smartsville, and gives promise of renewed prosperity for that place. The lead of rich matcrial opened is 30 feet wide and 50 feet high, and is believed to be an old river channel. The indications are that it can he followed up for a long distance. It is paying remarkably well. The cement is worked by arastras. There is another claim adjoining this, owned by Mr. Wheatoo, which will probably pay as well. The expectation is that a large number of men will soon find employment at Smartsville, drift mining.

NEVADA.

Washoe District.

BEST & BELCHER.—*Territorial Enterprise*, Nov. 22: On the 800 level west crosscut No. 2 has been cleaned out and repaired 30 feet; total distance, 300 feet. Formation, porphyry and clay. On the 1200 level upraise No. 1 has been carried up 12 feet; total bight 41 feet. Formation, hard porphyry.

GOULD & CURRY.—On the 200 level the northwest drift has been extended 10 feet; total length, 95 feet. Formation, quartz showing some value. On the 250 level, opposite east crosscut No. 1, a west crosscut was started and advanced 25 feet. Formation, quartz and porphyry. On the 400 and 450 levels from the old stopes have extracted 40 tons of ore of fair quality. On the 625 level all work is confined to repairs.

CROWN POINT. — Work prosecuted in various drifts and crosscuts as usual. Shipped to the Mexican mill during the week 386 tons of ore, the average battery assay of which was $13.56 per ton.

OCCIDENTAL CON.—The stopes on the 350, 400 and 450 levels are yielding 40 tons per day of fair-grade ore. The west crosscut on the north line, 650 level, is in 43 feet showing low-grade ore. The mill is working about 300 tons of ore per week of the average assay value of $20 per ton.

HALE & NORCROSS.—Crosscuts on the 800, 900 and 1100 levels all being advanced with some low-grade ore being developed. Have rctimbered 25 feet of the incline below the 1300 level, and have men on repairs in the main vertical shaft.

WARD COMBINATION SHAFT.—East drift from the 1800 station is out 685 feet. Face in porphyry.

SAVAGE.—During the week have hoisted 923 cars of ore from the 300, 400, 500, 600, 750 and 1300 levels. Shipped to the Mexican mill 492 tons of ore and to the Rock Point mill 363 tons. Milled during the week 750 tons, the average battery assay of which was $20.15 a ton. Have hullion on hand and at the mills amounting to $23,854.88. Prospecting pushed throughout the mine.

CHOLLAR.—The upraise 100 feet south of the north line on the 750 level is up 65 feet. Extracted and sent to the mill the past week 547 tons of ore. Average battery assay, $19.75.

BELCHER.—Shipped to the Vivian mill during the week 269 tons of ore tbe average battery assay of which was $23.24.

JUSTICE.—Shipped to the mill during the week 204 tons of ore, tbe average battery assay of which was $21.23.

YELLOW JACKET. — Shipped on an average 75 tons of ore daily to the Brunswick mill; tbe battery assays average about $18 a ton. The usual prospecting work is going on on the different levels.

ANDES.—The north drift on the 420 level was extended 15 feet. Formation, quartz and clay giving very low assays. The south drift from No. 1 west crosscut was advanced 12 feet. Formatinn, quartz and porphyry.

OPHIR,—On the 1300 level, the west drift is extended 35 feet in low-grade quartz.

SIERRA NEVADA. — On the 630 level the new southwest drift is out 53 feet in a soft porpbyry formation, which shows some water.

MEXICAN. — East crosscut No. 1 on the 1465 level has been advanced 28 feet in a soft porphyry formation.

UNION CON.—On the 1465 level, east crosscut No. 2 from the north lateral drift is out 257 feet. It continues in a soft and favorable porphyry formation.

UTAH.—On the 725 level the main soutb drift is out 793 feet and continues in soft porphyry containing some clay streaks. It is a promising formation.

CON. CAL. & VA.—Ore continues to be extracted from the 1200, 1300, 1500, 1600, 1650 and 1750 levels. Most of the ore is coming from the 1600 and 1650 levels. Some good prospects are obtained in the southwest drift on the 1750 level. The usual auount of ore has been shipped to the Eureka mill, the average assay of which will be about the same as last week. Exploratory work being pushed on other leading mines along the lode without any important ore developments being made, or other notable changes in the situation.

Trinity District.

PETERED OUT. — *Territorial Enterprise*, Nov. 20: A United States Marshal recently levied upon the mining properties of tbe Manhattan Co. at Austin for $150,000. The old Manbattan mill, which has ground out $1,000,000 on the average for about 25 years, has been dismantled, and what little ore is extracted from the mines of that once busy district bas to be shipped to Salt Lake or elsewhere for reduction. This mine was sold by the late John A. Paxton and others several years ago to Eastern parties for a hig sum. It was thought at the time by many tn he pretty well worked out.

STILL PLENTY OF WATER. — The volume of water in the Carson river is more than sufficient to turn the wheels of all the quartz-mills. The water, however, is in no place overflowing the banks of the stream.

ALASKA

GOLD PRODUCT.—*Alaskan*, Nov. 15: Lyman E. Knapp, the Governor of Alaska, in his annual report shows that among the exports during the last year was gold (estimated), $2,000,000; all other exports sufficient to make the total $9,840,730. He states further that considerable activity has been manifested, but no excitement in connection with the various mining interests. As the weather remains favorable, operations continue active in the quartz-mining districts, from all of which good accounts are being received. It now seems probable that a good deal of work will he done during the winter. It is believed that another year will see more than one hig gold mine opened up on the Treadwell helt, some of the other claims along that quartz zone being considered fully equal if not superior to that noted property.

ARIZONA.

DOING GOOD WORK. — Prescott *Journal*, Nov. 19: The Crowned King mill is running and doing good work, making three tons of high-grade concentrates per day. C. B. Bishop of the Four-Mile House is developing an onyx quarry or mine near Antelope station on the Black Canyon road. A new 10-stamp mill will shortly be built on the Hassayampa. J. J. Williams, superintendent of the Hackberry M. Co., is making a survey for a 20-inch gauge railroad to connect the Hackberry and Boggs mines on Big Bug. The length of the road will he about three miles. The company has also located a site for a smelter, which they will put up in the near future on Big Bug creek. The Catoctin group of mines in the Hassayampa district was sold yesterday.

HARQUA HALA MINES. — Phœnix *Republican*, Nov. 19: Col. C. H. Grey yesterday sold out his interest in the Harqua Hala group of mines to Hubhard & Bowers for $50,000 cash. There are some nine or ten claims in the group and they are all rich in gold-hearing quartz. The result of yesterday's sale will he the immediate renewal of work on the mines and the expenditure of over $100,000 in various improvements looking to their thorough development. The Phœnix *Herald* of the 12th says: A. G. Hubhard will erect a 20 or 30-stamp mill at Harqua Hala, piping water six miles from Harrisburg.

CARGO MUCHACHO. — Yuma *Times*, Nov. 19: The Blossom mine, about two miles from Cargo Mucbacho, will receive a 10-stamp mill on tbe next

steamer from the Needles. Water will be furnished to this mine by the Paymaster M. Co. by a pipe-line from the Cargo Muchacho reservoir.

BRITISH COLUMBIA.

FROM REVELSTOKE.—*Inland Sentinel*, Nov. 20: Fred Wells, who came here last week from Golden with about 40 tons of ore, carried home with him a round lump of money—nearly $4000. He expressed satisfaction at the quickness with which his ore was sampled and the value ascertained, the correctness of the assays, and the promptness with which he was paid the amount due him. J. M. Kellie, M. P. P., returned from Southern Kootenay this week after visiting all the camps except Goat River. He has formed a very favorable opinion of its mines and miners, and will go to the Legislature knowing all their wants and prepared to represent them in his official actions.

MICA DEPOSITS.—On Thursday, the 6th inst., Louis Victor and a party of Indians returned from a seven weeks prospecting trip up the North Thompson river. They had 25 horses with them, and although they had difficult work, made the up journey of 300 miles in less than two weeks. The country around the headwaters of the river and the Tete Juane Cache was covered with a foot of snow. Notwithstanding this impediment to the work of prospecting, they located the mica mines in which they were in search of, camping at the mines three weeks, staking out claims. The ledge they located shows 40 feet wide and 50 feet high on the side of the mountain, and indications are that they have struck a mountain of mica. Some fine samples were secured and brought to town, the largest of which was about 10x18 inches surface and almost as clear as crystal. Some cubes of almost two feet were exposed in places, a slice from one of which was broken in two in being brought to town. The mica splits readily to any thickness desired and is undoubtedly of as good quality as can be obtained anywhere, and its locators have evidently struck it rich. There was four feet of snow on the level when the party left the camp for home, and they experienced terrible hardships on the return trip, their horses suffering most, six of the animals dying from want of proper nourishment. They found lots of grass, but it seemed to have no substance in it.

COLORADO.

TOURTELOTTE PARK.—Aspen *Times*, Nov. 16: Every property of any note in Tourtelotte Park is now being worked except the Silver Bell, and most of them are showing up well. The O. K. is making a particularly good record. Manager Ellis is shipping 30 tons of ore per day that is of very good grade. The Justice has developed a very large body of low-grade ore about 300 feet southwest of the shaft. This is an entirely new chute. The fissure that runs southward was followed for some distance, and a drift from this work developed the new ore body. Everybody connected with the Good Thunder is highly pleased. The Little Rule is busy erecting an ore-house to accommodate the output. The mine continues to improve steadily, and its future is now assured.

THE GOOD THUNDER.—Both leases on the Good Thunder are showing up wonderfully well, and the property is evidently a bonanza. The mine is outputting from 50 to 75 tons per day, and the figure will soon be run up to double that amount.

STRIKE.—An important strike was made yesterday in the Jenny Lind mine near the head of Keno gulch.

THE mine-owners about Aspen are again suffering for want of ore-transportation facilities.

IDAHO SPRINGS.—*News*, Nov. 21: A strike of more than ordinary importance was made this week in the shaft of the Plutus. The Allen concentrator shipped 20 tons of high-grade ore from the Lexington yesterday. Energetic development continues on the Salisbury. W. S. Comer is jubilant over a strike which has been made at a depth of 30 feet in the Alpine shaft.

IDAHO.

A WISE SUGGESTION.—Ketchum *Keystone*, Nov. 11: The Legislature, soon to convene, would do well to make provision for the establishment and maintenance at Boise City of a State Mining and Geological Bureau. The East Fork of Wood river is steadily progressing. The *Keystone* predicts that it will be the liveliest camp in that section next spring.

ANOTHER REVIVAL.—Wood River *Times*, Nov. 19: In the early '80s Muldoon was a camp of considerable importance. It had a smelter, and three or four companies operated there. The returns being unsatisfactory, the companies suspended operations and the camp went down. The 300 or 400 inhabitants dwindled down to about a dozen. These last were stayers, however. Their perseverance seems about to meet with its just reward. The Telegraph claim, owned by Steve Winchester, is showing three feet of solid galena ore, a trial shipment of four tons of which, just made to Hailey, netted the owner an average of $108 per ton. Mr. Winchester has been working this claim nine years, and has shipped enough ore to pay expenses. Now, however, he has a good body of it. Two other mines in this group have also opened up bodies of pay ore.

THE DELAMAR MINES.—*Avalanche*, Nov. 22: Capt. DeLamar has recently purchased Frank Lepley's interest in the Zulu mine, connected with the Sommercamp group, paying $10,000 therefor. This was purchased to make his holdings of mining property one compact body, which is now complete, one mile long by three-fourths of a mile in width, or 480 acres. They have opened up a new lead of gold-bearing quartz on the DeLamar property. The lode is several feet wide and assays at a depth of 25 feet, $29 in gold and $4 in silver.

THE POORMAN MINES.—McElmeel and Mickelson have run a 200-foot tunnel on the south extension of the Illinois Central lode. They have a good showing of $80 ore. The Illinois Central is one of the group recently sold with the Poorman, and the above development is an evidence that the lode is continuously good. The same paper says that two very rich strikes have been made on Florida mountain. The Trade Dollar mine has run 30 feet into a body of ore that assays $6000 per ton. This rich ore is six inches wide; three feet more of the ledge will average $300 per ton. The ore strike is in the Phillips and Sullivan mines. They are now working in a chamber of ore fully 12 feet in width, which is proving enormously rich. A streak of talc clay in the lode, in places two feet in width, is literally bound together with wire gold, and massive specimens exhibited from this streak surpass anything in richness heretofore shown from Florida mountain.

LOWER CALIFORNIA.

ALAMO. — *Lower Californian*, Nov. 20: Two large bars of gold, amounting to over $6000, were sent down by the different companies of Alamo on the last stage. The Montezuma mill has closed down because of water in the mine. J. Albright is now above buying pipe, pump, etc. The El Paso mill is running on custom rock, also Lane's mill and the Manzanita. Thus it will be seen that Alamo is alive so far as milling goes. Contracting is quite lively and considerable ore is being taken out. The Aurora Co.'s hoisting works are expected soon and when they arrive the mine will become probably the best producer in the camp. The new 10-stamp mill will be set up in the gulch near the mine.

COAL.—The discovery of anthracite coal in Sonora is causing more interest to be felt in the coal measures of Arizona and Lower California. The diamond drill penetrated a vein of fair coal at the depth of seven feet below the surface. At 80 feet a vein of fine anthracite coal was struck.

MONTANA.

AROUND DEER LODGE.—*New North West*, Nov. 21: Nothing is being done in Bear Gulch now, the placers having closed down. About five miles east of Beartown some good silver quartz mines are being developed. The Phœnix Mining Co.'s Board will meet to-day to take the necessary steps to make their stock assessable.

ABOUT BUTTE.—Butte *Miner*, Nov. 19: Two-hundred-ounce ore has been struck on the 100-foot level of the Valley claim, which lies between the Vulcan and Star West, south of the city.

BUTTE AND BOSTON.—The new 400-ton concentrator at the Butte and Boston Co.'s works was started up yesterday for the purpose of testing the machinery. Everything about the new plant worked to perfection, and within 12 days the works will be in full blast with an all-winter run before them. The two new O'Hara furnaces are also finished, and work on the four Bruckner furnaces is being rushed to completion as fast as possible. The management is highly pleased with the working of the machinery so far complete, and considers that the company is now on the road to success commensurate with the enterprise exhibited. The Butte and Boston Co. started in on a small scale only two years ago, since which time it has more than trebled the capacity of its plant and extracted the money from its Butte properties with which to do it.

MADISON COUNTY.—Bozeman *Chronicle*, Nov. 19: The Little Kid, bought by Mr. McKelvey, is showing up a four-foot vein of high-grade ore, and is pronounced by experienced miners the best showing for a bonanza in the county. Work on the Red Chief mine at Red Bluff is being prosecuted with a force of 15 men, night and day. A rich strike was made on the Noble mine below Sheridan, last week. We have not learned the extent of the strike, but hear that it is extraordinary even for this great property, which has long been noted for the production of rich ores.

SALE.—Montana *Mining Review*, Nov. 19: The property of the Lone Pine Mining Co. has recently been sold to an English syndicate for $500,000 cash.

LARGE YIELD EXPECTED.—Butte mining men state that all indications point to the greatest total output of mineral for that camp during the coming winter that has ever been recorded to the credit of the camp for one season since its organization.

JEFFERSON COUNTY.—Last week a fine strike was made on the Pilgrim's Progress in the Woodland Park district. The vein is two feet wide, and in this there has developed a seven-inch streak of crystallized lead ore running 800 to 1200 ounces in silver.

NEW MEXICO.

GOOD MINES.—Silver City *Enterprise*, Nov. 21: N. Bell brought down from Pinos Altos last week 30 pounds of gold, and this week will ship about the same amount. The ore is from Bell & Stephens' Pacific mine. Two cars of copper bars were shipped from the Anson S. last week, and two more will be shipped next. At the present price of copper, a well-loaded car is worth from $7000 to $8000. From this it will be seen that the Anson S. is no small producer, considering that the development of the mine is as yet quite limited.

SILVER CREEK.—*Southwest Sentinel*, Nov. 18: J. A. Sperry of New York, a miner of 30 years' experience, has just visited the Silver Creek mining district in the interest of Eastern capitalists. He says that district presents the most wonderful showing of ore he has ever beheld. The croppings on either the Last Chance, Elberle or Consolidated mines, Mr. Sperry says, are greater than the croppings of the entire Comstock lode.

add min share market

CAMP CARLISLE.—*Western Liberal*, Nov. 14: A new strike has recently been made on the Jim Crow ledge about three miles from Carlisle and about 200 yards from the Duncan & Carlisle stage-road. It is called the Alabama mine. They are 15 feet down and have a vein of ore two feet wide. Twelve assays on vein matter went $271 the lowest and $584 the highest per ton, mostly silver.

UTAH.

BINGHAM.—*Tribune*, Nov. 18: The Stewart No. 2, Bingham, is a gold property which was worked for a time some years ago, and has remained idle ever since. Mr. P. A. Snell started to developing the property last June, and has made good progress. A body of pay ore has been developed of large extent and worth from $10 to $100 per ton.

UTAH'S MINING STOCK EXCHANGE.—Secretary Pollock of the Mining Exchange is busy with correspondence in the interest of the Exchange. He is in receipt of a letter from a Butte man who says he has been spending considerable time in St. Louis, Denver, Salt Lake City, San Francisco, Spokane Falls, Butte and Helena, and he looks upon this city as being the natural business center for handling mining stocks for all the West.

HORN SILVER IN THE TINTIC MINES.—From parties just in from Tintic it is learned there is great excitement in that camp over the find during the past week of horn silver in the Centennial-Eureka, also in the Black Dragon. This is very gratifying news, and confirms the belief that the whole country in that belt is very rich in metal. The mines in Tintic are all the time showing up better and richer as they go down and crosscuts are made. This is particularly the case with the Bullion-Beck, Eureka, Centennial-Eureka, Mammoth, Northern Spy, Eagle, Governor, Carissa and others, which have in the past months of the year been turning out so much ore. The aggregate output of these mines will be a surprise for this year when the figures are made up. There are a dozen more properties which will become big producers within the next few months if the present indications develop truly. It is said an immense body of horn silver was struck in the Keystone in the last few days. Two carloads of it are now on the dump and the lowest assays give 297 ounces.

DIVIDENDS.—The Daly has declared dividend No. 45, payable in this city, San Francisco and New York, of 25 cents per share, aggregating $37,500, payable Nov. 29th. The Centennial-Eureka paid its dividend of $2.50 per share, or $75,000, yesterday, Nov. 16th.

BUSY MINERS.—At least 1500 miners are now employed in the mines in the Tintic district.

A NEW DISTRICT.—Eureka *Chief*, Nov. 14: There have been rumors for some time that a rich ore discovery had been made in the mountains south of this district, but no accurate information could be secured until last Saturday, when the *Chief* obtained an interview with Col. A. W. Smith, a Colorado expert, who has spent the past six years in Chili, Peru and Old Mexico in the interest of wealthy companies. His attention was drawn this summer to this district, and he prospected it thoroughly, arriving at the conclusion that the Mammoth vein continued south and must come to the surface somewhere in those mountains. Here the search for the vein really commenced and a big porphyry was discovered, and mineral estimated to be worth $15,000 lay in view. A mill test on the ore gave $133 silver, $62 in gold, 28 per cent lead and a unit in copper. Two claims, the John P. Jones and Henry M. Teller, were located, and two wells were sunk and water obtained. Colonel Smith feels confident that the discovery is the continuation of the Mammoth vein and that a very rich mine will be developed. He left Saturday for the find to commence development.

SOUTH DAKOTA.

ELK CREEK DISCOVERIES.—Deadwood *Pioneer*, Nov. 15: Several new discoveries are reported from the vicinity of Elk creek. The ore is principally a carbonate, and goes away up in gold and silver. The formation is lime rock, and the veins go down nearly perpendicularly. There seems to be no reason why this section should not become one of the greatest mineral-producing localities in the Hills. It lies just east of Galena, in a direct line with the course of the veins of that place, and throughout the limestone have been found some extremely high grade silver rock float.

IRON CREEK.—Work on the Iron creek placers has been closed down for the season. Never before in the history of the camp has the work proved so unprofitable as during the last year.

WASHINGTON.

GOOD PROSPECTS.—Okanogan *Outlook*, Nov. 19: C. H. Ballard and Wm. O'Neill returned Monday from a trip to the Similikameen and Palmer mountain districts. Mr. Ballard has been examining several mining properties for different parties, and brought in a lot of ore specimens for assay. He says that part of the county which he has just visited is showing up splendid, as a result of the development of the last season. Several prospects have been opened up which will compare favorably with any located in either Conconully or Ruby districts. "The Ivanhoe," he says, "is indeed a wonderful prospect, and I might almost say the best I ever saw. There are tons and tons of ore in sight that will mill from $300 to $500 per ton, with here and there deposits that will run up into the thousands. But the most wonderful part of it is the manner in which the ore is being extracted. The loose soil is removed with a plow and scraper, leaving the ledge bare and ready for breaking and sacking. It is estimated that there is $150,000 worth of mineral in sight. A shipment of 10 tons was recently made of ore that will run from $300 to $500 per ton. Messrs. Cowherd and Westren are comfortably located with their families at the mine and are doing some good work. There are hundreds of good prospects in Okanogan county, but really I believe this is the bonanza."

VARIOUS MINES.—Several tons of ore from the First Thought mine were shipped to Tacoma last week for treatment. This is the first shipment of a large quantity ever made from this mine, and all are anxious to know how it will run. Mr. O. F. Zienkeison, of Spokane, has secured a bond on the Opbir claim, a fraction located on the north extension of the Lady of the Lake lead. He has a force of men employed in running a prospecting tunnel. The Mohawk mine on Mineral hill is producing some fine-looking ore. Mr. Lawrence, the owner, brought down a specimen this week, that weighed about 100 pounds. The character of the ore is a high grade galena, carrying a large per cent of gray copper. The tunnel is in about 130 feet on the lead, which is over four feet wide. The mines in the Silver Creek and Monte Cristo districts are assuming great proportions and attracting much attention, and at a day not far distant there will be a railroad running right to the mines, and the vast mineral wealth of those mountain deposits will be hauled to large smelters which will be built at Sultan and employ a great many men.

WYOMING.

IRON AND COAL.—*Republican*, Nov. 19: Almost in the geographical center of Wyoming is a mountain of solid hematite iron ore more than a mile wide and two miles in length. Besides the iron, the mountain contains lignite coal enough to warm the entire world for a century. A dozen dried-up lakes of soda, where the soda is deposited to a depth of over 300 feet, occur near by. In his report to the Secretary of the Interior, the Governor of the Territory says mining presents the greatest possibilities of any of the various resources of the commonwealth. The area underlaid with coal exceeds 30,000 square miles and coal mines are being rapidly developed and the output greatly increased. No strikes or disturbances of any magnitude arising out of disagreements of employers and employes have occurred for years. The State geologist is now in the field examining new mineral discoveries and will soon have ready his report upon the mineral resources of the State.

Mining Share Market.

For the first three days of the week under review, the Comstock shares showed considerable strength, with a slight advance established in the leaders. On Monday the market opened strong at an advance, which resulted in a further advance after regular Call under active trading. Prices kept up in the afternoon Call but weakened after Board. Yesterday morning the market opened inactive at lower prices, with apparently outsiders selling. After the Board, trading continued quiet at unchanged prices. In the afternoon there was but little business, with the market weak. After Call, Overman developed considerable strengh and under freer trading the stock scored an advance of about 20 per cent on Call prices. The other stocks advanced slightly in sympathy. In outside stocks the market was dull, with only the Bodies scoring an advance. The upward movement in the Comstock we indicated in our last week's issue. While the writer believes that still higher prices will obtain, yet caution is advised, and that a small profit is much better to take than to try and get the "earth and a fence around it," for those who follow the latter course generally come out without even a picket. The above opinion is based upon the belief that the moves in the market do not indicate that such men as Senator Fair, Gen. Hayward and Col. Mackay are at the helm, but on the contrary they indicate that a few outsiders have pooled their interest and grown rich by little stealing deals. As long as the latter run the markets a small profit is better than the talked-of large profits which seldom materialize. The former persons never have, so far as we can learn, been largely identified with stocks unless based on merit in the mines.

It is very generally believed that while the mill ring gets away with the bullion from the mines, a stock-gambling pool here gets away with operators' money through petty deals on big bull points.

The share market opened this (Wednesday) morning dull and barely steady. After Call, prices shaded off under light trading. The points are out for a little higher figures, then lower prices. Many are waiting for the lower prices to come and then buy.

The news from the Comstock mines continues of a very encouraging character, with the most important results looked for in the west workings. Strikes to the west heretofore reported in one or more of the mines are either being or will be developed in all directions—provided before it be done thoroughly the new find of ore is not claimed by companies located to the west. This is more than likely to be the case and dealers in the shares of the *now* leading mines must keep their "weather eye" well open to see which mines will get the ore after it is developed. Official letters from some of the Gold Hill and Middle mines were not in the offices up to this (noon) writing, but it is hardly likely they contain more than the usual skeleton report. The move in Overman is doubtless based on better concentrated stocks which admits of more important prospect work. The superintendent of Caledonia reports that work in that mine will be resumed on the 1100-foot level where there is a streak of ore assaying a few dollars a ton. An accident in the Andes shaft last week would have been the death of several miners had they not got out through a manway into West Con. Virginia shaft. Work in sinking the latter company's shaft is being vigorously pushed.

In answer to an inquiry we state that the action against the directors of the Hale & Norcross Mining Company is not dead, but on the contrary it is said much valuable testimony is being secured by the plaintiff. The latest deposition taken is that of U. S. Senator Jones.

A Big Thing.

Col. E. N. Robinson, general manager of the San Jacinto Estate, limited, has recently returned from England, armed with the sinews of war. His plan for the development of this valuable estate has met with the entire approval of the chairman and directors of the property, which can but add so largely to the prosperity of not only our county, but the whole Pacific Slope, as well as to the United States of America. We confidently predict that the Temescal tin district, which is situated in the central portion of this immense estate, will, in the near future, be to the United States of America what Cornwall has been to England during the past 400 years. It comprises 45,126 acres, or 70 square miles of territory, and not only contains cassiterite, the oxide of tin, of an unusual high per cent, which is the most valuable ore of tin known, but veins of gold in place that compare favorably with our most prosperous gold-produers on the coast, not even Grass Valley or Amador excepted. The ores of nickel, copper and silver of high grade are also found in the northwestern portion of the estate, as yet only partially developed, but of great apparent value.

In the southeastern portion of the estate, the celebrated series known as the Gabilan occurs in a porphryitic granite formation, bearing a strong resemblance to the auriferons veins that occur in Grass Valley and Nevada, which have been so highly productive. These veins are strong and well defined and have been worked for their values to a depth of 400 feet on the inclination of the lode, until water prevented further development. The ore of this mine paid from $30 to $50 per ton, and was hauled nine miles to a mill for reduction, and made the owner rich. The works were discontinued on account of water litigation and no lease.

The manager, Colonel Robinson, has decided to rehabilitate these mines in a business way, and has wisely employed J. H. Crossman, formerly of Grass Valley, as consulting engineer and to superintend the work of development. Mr. Crossman has inaugurated the work under instructions from Manager Robinson, and ordered suitable buildings and material, and will take charge in person of the work of development until the mines are a bonanza and dividend-payers. He is confident of success, and knows whereof he speaks.

MECHANICAL PROGRESS

The Activities of Our Iron Industries.

The activities of our iron and steel industries, the enormous output and the steady demand, says the *Age of Steel*, constitute part of the industrial phenomena of the present decade. The market has absorbed the product without strain, and the state of the ironmaster has had as yet no innocent blanks on its surface. This activity has been world-wide, and the industrial situation generally exuberant. Edward Atkinson has been studying the cause of this phenomenon and looking into the prospects of its continuance. The demand has not been the result of temporary conditions. Iron and steel are here to stay, and in diversified and in varying forms to become more and more part of our industrial life and structural enterprises.

The present production of pig iron the world over is 28,000,000 tons, of which the United States will make in 1890 not less than 10,000,000 tons, and in the next ten years, or in 1900, about 44,000,000 tons; the demand for iron at that time being on a reasonable computation not less than 56,000,000 tons. These figures are based on the normal growth of the last 50 years, and are independent of the demand that must logically increase in the opening up of Asia and Africa.

With these considerations in force, the statistician asserts that the producing capacity of all iron-producing countries will be fully taxed for the next ten years, and that where the raw material can be assembled at reasonable rates, and furnaces be operated to advantage, there is, barring unforeseen contingencies, an absolutely certain prospect for continued activities.

He places prices as possibly oscillating in a small way, but with an upward tendency; and the trend of the American iron industry as yet to be centered in the Appalachian region of the South. Accepting all possible interruptions or qualifications of this iron and steel forecast, the significance of the situation is that of continued activity in these industries.

Fast Coming to the Front.

Another iron trade journal has the following: That this country is rapidly forging to the front as an industrial nation is evidenced by facts that are being brought out by the reports of the Census Bureau for the last decade. The consumption of iron and steel is an indication, admitted as evidence of a country's industrial thrift, and the returns of the Bureau just issued show that the United States leads all other countries in certain lines of iron and steel production, while it is rapidly gaining in others. The total production of steel in 1889 was 4,466,926 tons, an increase since 1880 of 290 per cent. In the ten years from 1880 to 1890, the production of Bessemer steel ingots and direct castings has increased from 985 208 to 3,778 572 tons; open-hearth steel from 84,302 to 504,351 tons; of crucible steel from 76,201 to 85,536 tons. No Clapp Griffiths or Roberts-Bessemer steel was made in the census year 1880, as there were no works in existence in this country at that time. During the year ended June 30, 1890, the production of Clapp-Griffiths steel in the United States was 83,963 tons, and the production of Roberts-Bessemer was 4450 tons. The United States now leads all other countries in the manufacture of Bessemer steel rails, the output during the year ended June 30, 1890, amounting to 2,036,654 tons—an increase of 1,295,179 tons over the production of the year ended May 31, 1880. In the manufacture of basic steel this country has made a prosperous beginning, the production of this kind of steel during the year ended June 30, 1890, amounting to 62 173 tons.

MOTIVE-POWER FOR MECHANICAL USES.—Wonderful are the possibilities of the future in respect to motive-power for mechanical uses. At present the growing conviction seems to be that electricity will be the great agent for all industrial uses of power, and yet there are some who hold to the belief that the distribution of motive-power from a given station of development will be effected by means of compressed air. What appears to be a very successful attempt in this direction has been made in England at Birmingham, where, by means of a steam engine located at a central station, compressed air with a pressure of 45 pounds above the atmosphere is delivered in pipes laid in the street like gas pipes and carried to a distance of four miles. At convenient points the mains are tapped for air-power, which is supplied to industries to the number of 40, and it is said the loss by friction is practically unnoticeable and that the power is applied to engines varying in size from a half horse power up to 50-horse power with great satisfaction to the consumers. One evident advantage of this method is the convenience of having motive-power where wanted, without the necessity of erecting boilers and engines, although this of course is also true of electrically conveyed power and of steam taken from pipes and conveyed to a considerable distance, as is already successfully done. There is something very pleasant in the suggestion of driving one's machinery by simply opening a pipe of air compressed at a distant station, without the annoyances, expense and danger of manufacturing steam upon the premises in the ordinary way; but whether the compressed-air method is economical in comparison with other recent improved methods of transmitting power remains to be proved by longer continued experiments than those which have yet been made. In this wonderful age anything seems to be possible, and who knows but what compressed air may be one great means of mechanical propulsion in the near future?—*Railway Age.*

A NEW METAL FOR BULLETS.—The intensity of the competition between civilized nations in the application of the latest discoveries and inventions to their equipment for war is again illustrated by the current interest taken in German military circles in the new Wolfram rifle bullet. Lead has been used so long that few people outside of the military establishments in any country have ever considered the possibility of its displacement by a harder metal. Wolfram ore is a tungstate of iron and manganese, which in its metal form is nearly as hard as steel and very brittle. Fifty per cent heavier than the old leaden ball of the same size, the Wolfram projectile does the same work at a distance of 1200 metres that the present model 88 bullet does at 800 meters. It is said to penetrate a steel plate eight millimeters thick at a distance of 600 meters, while the leaden bullet penetrates an iron plate but seven millimeters thick at a distance of 300 meters. Among the advantages of the new projectile is that which allows a much lighter rifle and therefore a greater store of ammunition for each soldier. Considerable doubt is expressed that sufficient quantities of the new metal could be mined for the needs of the whole German army in time of war, but the mine-owners claim to be able to provide all that the Government could use. Should the Wolfram bullet prove wholly successful in the tests given, its adoption and use in war would add another interesting and quite unknown factor to the character of the next great European struggle.—*Springfield (Mass.) Republican.*

STRENGTH OF MANGANESE BRONZE.—A manganese bronze tube similar to those used in hydraulic gun carriages was recently subjected to a severe test by Messrs. Armstrong, Mitchell & Co., England. The tube was 4.9 inches outside diameter, 0.3 inch thick and 18 inches long. An internal pressure of 4000 pounds per square inch was applied without increase of outside diameter; 5000 pounds pressure produced an enlargement of 0.03 inch; 6000 pounds pressure increased the diameter 0.08 inch. The testing pump could not go beyond this pressure, so the tube was turned off to an outside diameter of 4.55 inches, leaving it 0.125 inch in thickness. A pressure per square inch of 1000 pounds produced no change of diameter; 2000 pounds pressure increased the diameter 0.1 inch; 2500 pounds pressure burst the tube. Two longitudinal specimens were taken from the tube and tested for tensile strength. They gave an ultimate strength of 31.5 tons per square inch and a stretch of 27½ per cent in 3 inches. Some of the advantages of tubes made from this metal are, freedom from the pitting and corrosion experienced with steel, and a strength when annealed double that of the best copper. For the same strength, manganese bronze tubes weigh about one-half that of copper or brass, and cost about one-third less per running foot.

NEW THING IN PIPE WELDING.—In welding together pipes by the electrical method it has been the usual practice to employ internal mandrels to prevent collapse or change of circumferential outline. Prof. Elihu Thomson, however, has recently invented a simple process by means of which the use of internal fixtures is avoided. The invention is based upon the fact that if a hollow structure be heated at a certain portion of its length and subjected to an upsetting action, it will bulge exteriorly instead of collapsing. The structure will therefore have a larger diameter at the swelled portion. In the present process, where it is applied to the welding of pipes, hammer blows are delivered at the weld or on the side of the pipe, and are so graduated as to simply contract this bulging or lateral spreading tendency. The hammering is delivered laterally so as to restore the metal back to its original position on the sides of the pipe. There is no tendency to collapse on account of the bulge of the pipe acting as a sustaining support.

AMERICAN IRON has made rapid inroads on the Scotch trade with Canada. When an American furnaceman contracts to deliver No. 1 foundry pig iron, he sees that it is all tested and of the same grade. The Scotch are careless in this respect, their shipments being unevenly graded. An English paper, the *Iron and Steel Trades Journal*, commenting upon the situation, says: "Advices from Canada show that the demand for Scotch iron has completely passed off, and unless something unforeseen arises, that market seems wholly lost to us; buyers cabling that their wants are being met by a cheaper and in some respects superior quality of American iron." The *Coal and Iron Trades Review* adds: "If it were not that Scotch pig is so useful for freightage purposes, it is doubtful whether the quantities sent to the United States would not dwindle to zero to-morrow."

ALUMINUM WIRE is being used for calking steam pipes in New York. A wire of one-quarter inch diameter is used, one turn of aluminum wire being first inserted, followed by four or five turns of a lead wire of slightly larger diameter, these last being calked in the usual manner. It is found that the aluminum does not cut, and is not acted upon by the steam as the lead is, so that the joints, it is claimed, remain tight.

SCIENTIFIC PROGRESS.

Man and Science.

It is only the supreme intellect of the human mind which renders what may be called the brute senses of man of use to him, because when untrained they rank far below the senses of the animal, though in the latter they are not so evenly balanced as in man.

The eagle and condor have wonderful vision. Of these birds it is said that the former can face with an unflinching eye the sun when shining with full noon-tide glory, and of the latter, Prescott in his "Conquest of Mexico," says: "The sight of the condor of the Andes is almost beyond belief. When a horse or mule drops by the roadside, scarcely a moment passes before one or more of these huge birds may be seen hovering over the unfortunate animal, proving plainly that they are guided by sight alone."

The sense of smell in animals is perhaps found in the highest perfection known in the well-bred bloodhound. This animal will follow a trail hours after the man or animal has passed, and never lose it, even though it had been passed over by hundreds.

The sense of touch possessed by the clumsy-looking elephant is most wonderful. The tough-looking hide which covers him would never make one think he could lay claim to the sense of touch in any degree of perfection.

Man supplements what he lacks by using his knowledge of the laws of nature. Thus, with the aid of the microscope and telescope, he can compete with the eagle and condor.

Up to the present time he has not invented any instrument which will aid in distinguishing odors, but passing over that, he has covered nearly the entire range embraced by the five senses—sight, taste, touch, smell and hearing.

When we speak of trained senses, we do not for an instant mean to imply that the man of the present age is better equipped by nature with the senses than his ancestors were, but that by the aid of scientific instruments he has supplemented the use of these senses to an almost supernatural extent. However, beyond a certain point he cannot go, as it is only in his power to use intelligently the things that be, not to create.

Every invention of man thus far has only consisted in some new or perhaps forgotten application of a law of nature, and is not in any way dependent on the inventor personally, save in his ability to make his knowledge of practical use to the majority of mankind.

The man of science is the idol of the present age. His daring and success in the field of invention have blinded the eyes of the people to the fact that there can be a limit to his power, and make them lose sight of the reality that he is only a pupil in the school of nature, where the doors are open to all.

It is not probable that any special benefit will be done mankind physically by this training, for it does not demand any abnormal conditions. It is simply a better understanding of our physical capability of using our senses by intelligently applying them to obtain a result known to be as certain as the law, "water seeks its own level."

There is a vast change in the tendency of the inventors of the present age, and this generation especially. Force is guided rather than controlled, and the result is that machinery has become more delicate and often more simple, but requiring by that very fact a more highly educated mind to operate it than did the crude machinery of the early inventors, where muscle was as much needed as knowledge. All that is changed. Ignorance is now often death-dealing, particularly when electricity is the motive-power or where chemical compounds are used.

Every day adds to the necessity for a practical working knowledge of the numerous inventions which are now found in daily use in all civilized countries the world over.

No one who has ever read "John Halifax, Gentleman," can forget the masterly description given of the personal antagonism felt by the workingmen to the machinery which was placed in his mill by the hero.

In their blindness they could not realize that mental labor placed them on a higher plane than manual labor, and that machinery at its best can only supply muscle, not mind, and that they were being given, by the very machinery which they were bent upon destroying, their one chance to be something more than mere machines themselves.

It is to be hoped as the world grows older it grows wiser, and that we are being carried to a "Golden Age" on the wheels of the inventions of the twentieth century.—*Dorsey Barton in the Scientific American.*

APPARATUS FOR MEASURING THE WEAR OF RAILS.—An ingenious apparatus for tracing the outline of rail sections so as to show the wear has been invented by Mr. W. Schilling of Stettin, Germany, "baumeister" of one of the government railways, and is already in use on several roads in that country and Russia. A full size section of the rail to which the apparatus is attached is very rapidly traced with great accuracy upon a sheet of paper, and the section thus produced can be readily compared to the standard section by placing a tracing of the latter over the former, when any wear will be at once apparent. A pointer attached to a little carriage movable both in a vertical and horizontal direction is attached to and worked round the rail, while a pencil traces a corresponding line on a sheet of paper. The slide can be moved freely in a horizontal direction on the rail. The paper is clipped on a little frame which can be swung backward to insert a new sheet. The inventor states that with a little practice the instrument can be set up and an outline drawn in less than two minutes.

PACIFIC COAST WEATHER.—The present season, thus far, has been one of unusual deficiency of rainfall for this coast. The cause of this deficiency is said to be due to an unusual falling off in the number of storms which have entered the North Pacific Coast from the Japan current, and also, and more especially to the fact that these storms have passed eastward at a higher altitude than in previous Octobers. In order to illustrate this very important fact, says Dr. G. G. Tyrrell, Secretary of the State Board of Health, I have prepared a set of storm-track charts for October, 1889, and 1890. A glance at these charts will show the relation between the extreme southerly position of the storm paths of October, 1889, and the extraordinary rainfall of that month, and the relation between the extreme northerly position of the storm paths and the marked deficiency of rainfall for October, 1890. The amount and distribution of rainfall dependent upon the latitude of the storms from the Japan current is one of the most important features of Pacific Coast weather, and is worthy of the careful attention of the public. According to the Signal Service report, the late spell of very warm weather was due to the extraordinary state of high barometer which during that time prevailed over this State and Nevada. At one time the barometer in Nevada registered 30.74 inches, 0.59 inches above the normal condition. At the same time the barometer at Roseburg, in this State, stood at 30.60. The former is the highest register ever known on this coast.

PRECIPITATION OF TIN.—The Journal of the Chemical Society gives an abstract of a paper on the "Precipitation of Tin from Acid Solutions by Metallic Iron," by B. Schultze. Tin is completely precipitated from solution in inorganic acids by the action of a mixture of metallic tin, metallic iron, and iron rust. The free acid is neutralized by the ferric hydrate, the stannic salts which are simultaneously formed are reduced by the tin to stannous compounds, and from these all the tin is thrown down by the iron. The operation requires several days for completion, and the absence of every trace of free acid and stannic salt is essential to success.

PHOSPHORESCENT INFECTION.—The curious discovery has been made that the phosphorescence frequently exhibited by the crustacea is infectious. A French naturalist, M. Giard, lately traced the phosphorescent light in *Talitrus* and other crustacea to bacteria in the muscles, which showed signs of disease. On inoculating healthy individuals, the same luminous appearance was produced. The disease runs a regular course, and the crustacea died in three or four days, the phosphorescence lasting a little after death.

PROGRESS OF THE ENGLISH LANGUAGE.—Ninety years ago the seven principal languages of Europe—English, French, German, Russian, Spanish, Italian and Portuguese—were spoken by 162,000,000 people. Only 21,000,000, or 13 per cent, spoke English. Now these languages are spoken by 400,000,000 people; and 125,000,000 of them, or 31 per cent, speak English.

A NEW PHOSPHORUS COMPOUND.—Prof. T. E. Thorpe, the well-known chemist, has discovered a new compound of phosphorus (P_4O_6), which takes the form of acicular crystals, melts with the warmth of the hand, and glows under the same conditions as phosphorus. It burns readily in oxygen and chlorine, and forms a new compound with ethyl alcohol.

SUBSTITUTE FOR CAMPHOR.—In view of the greatly augmented demand for camphor for the new uses found for it in the arts, with consequent enhancement of price, it is proposed to use naphthalin as a substitute for it in antimoth applications. It is quite as effective as camphor, and, being also equally volatile, leaves no more permanent smell.

ANOTHER NEW ELEMENT.—A new element, named "damaria," is said to have been discovered in the crater of an extinct volcano in Demaraland. It is reported to have an atomic weight of only 0.5, or half that of hydrogen, and therefore it is the lightest known substance.

BLACK SEA SOUNDINGS are said to show that below the depth of 600 feet the water is so impregnated with sulphurated hydrogen gas emanating from decaying animal and vegetable matter that living organisms are not found there.

THUNDER CLOUDS.—The explanation of the peculiar density of thunder clouds is said to lie in the fact that the vapor is partially condensed into drops by the electrical action.

SCIENTIFIC PROGRESS.—It is impossible to predict the boundary line of scientific discoveries, or the uses to which man may put them in the future.

GOOD HEALTH.

The Consumption Cure.

Nothing in the progress of medical science has excited such a sudden and world-wide interest as the recent discovery of Dr. Koch of a cure for consumption.

Dr. Koch has been seeking a cure for consumption for several years. He has conducted his inquiries from the first on the theory that consumption was caused by micro-organisms, although his medical confreres were at first disbelievers in the germ theory; but the doctor kept right on in that line. He began by pure cultivation of the bacillus, and found ethereal oils, tar pigments, mercurial vapors, salts of gold and silver, and especially cyanide of gold, efficacious in destroying the germ, *but this could not be done* in the *body* of animals without also destroying the animal.

"I continued my search," he said in a recent address, "and at last *found what I sought!* Susceptible as the guinea-pig is to the tubercle bacillus, it proved *non-inoculable* when treated with the substance in question. Even when the disease was *far advanced*, it could be brought to a standstill by this means."

This fact may give occasion to search for similar effective remedies in other infectious diseases also, and here lies the field for an international contest of the highest and noblest kind.

His preparation for this cure is a transparent liquid, which is injected subcutaneously, at first in infinitesimal, but gradually increased quantities. When taken into the stomach, it has no effect. The effect of the injection is to produce necrosis, or mortification of the tubercular tissue, in other words, to kill the bacilli in the lungs or in whatever organ attacked. Once killed, nature tries to expel the corpses, as it does with all dead tissues; and here the aid of the physician or surgeon may be required to complete its purpose. When the necrotic matter is expelled from the system the patient is cured, though the treatment should be continued for awhile in order to prevent fresh settlements of bacilli. Dr. Koch is careful to say that his system is only likely to succeed in the early stages of tuberculosis; where there are large cavities in the lungs, in which bacilli are lodged in great numbers, he doubts the power of the fluid to expel them; but in the earlier stages of the disease he is confined to be confident of the efficacy of his remedy.

The doctor keeps to himself the secret of his discovery. He has not revealed the material employed in its manufacture, or the method of its preparation.

It is said that patients who have been treated in the early stages of consumption have been freed from the morbid symptoms within from four to six weeks, when they may be regarded as healed. Consumptives with large cavities in their lungs will probably experience a benefit from the new remedy only in exceptional cases. In all cases, Prof. Koch emphasizes the necessity of early treatment. Only in the incipient stages of the disease, he declares, can the remedy fully develop its efficacy. He deprecates the mechanical and indiscriminate application of the remedy, holding it preferable that the treatment should be applied in suitable institutions where careful observation is possible.

This cure received its first great impetus during the World's Medical Congress which recently met at Berlin, and was attended by physicians from all parts of Europe and America. Since that time hundreds of medical men, not attendant upon the Congress, have visited Berlin to acquaint themselves with the treatment. Hospitals are also being established in many of the large cities in Europe and this country for this special treatment. It is said that there were some 1500 foreign physicians in Berlin on the 16th instant.

This treatment has been tried for lupus of the face—a variety of cancer—but has not proved altogether successful. In one case, treated by the doctor himself, it has again reappeared, as it generally does after treatment with the knife.

Can Cancer Be Cured?

Prof. Billroth holds that Koch's method places beyond a doubt that a remedy will be found before long for cancer. If the medical faculty of this State would only do its duty, it would be able to prove to the world in less than a month that there is already a "cure for cancer" in this city—that scores of cases which have been pronounced as unmistakably cancer by the leading physicians of this city and State and by many such in New York, Washington, and other Eastern cities, have been cured without the use of the knife or plasters.

Objection is made to investigation here for the reason that the practitioner, although a regularly licensed physician, refuses to divulge her secret. The medical faculty of Europe does not place such a hindrance in the way of investigation; for Dr. Koch, like our San Francisco physician, also refuses to reveal his secret.

Dr. Koch is not without his doubters, although about the only criticisms thus far have come from French medical men, some of whom advise incredulity until the *nature of the remedy is fully known* and scientific proof given of its effectiveness—thus following the footsteps of our San Francisco physicians.

The cancer cure discovery which now in a great measure lies dormant in this city, will soon be brought more prominently before the public. Active measures are already being taken to that effect. When the facts in regard to what has been done here in that direction are properly placed before the world, the excitement will be scarcely less than that which was attendant upon the discovery of Dr. Koch. Consumption and cancer are the twin demons of disease which have stalked through the world thus far with very little hindrance, but there is good reason to believe that they will soon be placed as completely under control as the smallpox has been by Jenner, and much more so from the fact that neither is especially infectious.

ELECTRICITY.

AN ELECTRIC WELL DIGGER.—Electricity is now being employed in this part of the country in the process of drilling oil wells, says the Pittsburg correspondent of the *Western Electrician*. This new electrical device, for which a patent has been granted to Wesley Webber, has the object of entirely supplanting the heavy tools and performing in a scientific manner the work which has hitherto been accomplished in a very crude way. The device is composed of a series of motors, placed in tandem and connected to one another, so as to practically form one motor. The reason for using the motor in tandem is to get the power within a 6-inch diameter, so that the entire mechanism, which looks like the common boiler, can be lowered in the well and the power applied direct at the bottom, which is the true plane of resistance in "making a hole." Projecting from this motor tandem is a rod, which resembles a piston-rod, working in and out of the cylinder; upon this rod the drill bits are firmly fastened and then the apparatus is lowered into the well in the ordinary manner. The mechanical construction and action of the apparatus is a close resemblance to the street-car motor. A number of tests, which have been made with the electric oil-well digger, were pronounced to be entirely successful.

HISTORY OF ELECTRIC LIGHTING.—Electric lighting, says M. Fontaine, did not make its appearance until near the close of the year 1873. It was in Paris, in November, 1873, in the workshop of M. Gramme, that the first installation, on a really industrial scale, of electric lighting took place, by means of a continuous-current dynamo and Serrin regulator. It was also in Paris, in 1877, that the Jablochkoff candle was first employed; 16 lights, distributed over a distance of about 1100 yards, being supplied by a single alternate-current Gramme machine. Paris, therefore, had the honor of possessing the first public and private lighting produced by means of electric current. M. Fontaine thinks that in 1891 or 1892 the electric lighting in Paris will require for its production motive force equal, in round numbers, to 32,000 horse-power.

ELECTRICAL PRANKS.—Under the title of "Electrical Pranks," a recent number of the *Engineer* notes some peculiar facts as to the effect of high-tension currents for power and light purposes on telephone and telegraph lines. If two wires are stretched side by side but not touching, a current sent through one of them will cause a current to flow in the opposite direction through the other as long as the first current is fluctuating. When this current becomes steady, however, all the inductive effect in the second wire disappears and no current flows. The majority of the dynamos now in use are alternating, or generators of current whose electromotive force alternately rises and falls. A current from such a machine is constantly fluctuating, and consequently always tends to set up induced currents in other wires.

A REMEDY FOR TELEPHONE INTERFERENCE seems to have been found in the method of track wiring adopted by the Albany and Troy road, provided that long practice demonstrates that the experiment is a practical success. The method as described in the proceedings of the Rochester convention consists in grounding the return wire at intervals in deep wells or connecting it with metal rods driven ten or fifteen feet into the ground. It is claimed by this method that a better return is secured and all telephone disturbance avoided. Certainly this is an important discovery, and further experiments in this direction should be made.

NEW ELECTRIC CLOCK.—The new form of clock soon to be manufactured is certainly an apparently radical departure from the present style of clock. Winding is entirely dispensed with. An electric battery is concealed in the clock, and motion is given to the pendulum by simply opening and closing the circuit, in which action a little magnet assists. Charging the battery occasionally is all the care needed. The clocks are to be manufactured by the Waltham Electric Clock Company, Natick, Mass.

CARE OF LAMPS.—To secure a brilliant, white light, a lamp needs a thorough cleansing every little while. The oil should be poured out of the fount, leaving no dregs on the bottom. The fount should then be washed in strong soapsuds, rinsed in warm water and dried. It should then be filled with fresh oil. The burner should be boiled in soda and water until the network that crosses it is freed from dirt and dust. If the wick has become clogged with the sediment, replace it with a new one.

USEFUL INFORMATION.

THE SMOKEBALL IN WAR.—In the sham fight at Portsmouth in honor of the Emperor William, an advancing column was so affected by the fumes of the smokeball, which was used to raise a cloud of impenetrable obscurity under which they could advance, that the men had to keep their hands to their noses to avoid suffocation. It is now proposed that the smokeball shall receive a further development. It has occurred to some military men that instead of half suffocating their own troops, it would be better to follow the example of the Chinese pirates with their stinkpots, and asphyxiate the enemy. A Vienna scientist has accordingly invented a bomb of such power and virulence that every one who is within a certain radius of it when it explodes is rendered unconscious. Devices such as these would soon modify the art of war, and probably the next development will be an anti-asphyxiating bomb, whose fumes will neutralize that of the other. It is said that many years ago a scheme based on the throwing of poisonous gases over a tract of country was put before the War Office in England, for the purpose of devastating the country in the face of an invading army, but the agency employed was so terrible in its effects that it was not made public, and was consigned to the secret records of the War Office.—*Ex.*

STATISTICS OF STEAMBOAT TRAVEL.—Inspector-General Dumont of the Steamboat Inspection Service has made a report to the Secretary of the Treasury of the operation of that service during the fiscal year ended June 30th last, of which the following is a recapitulation: Total number of vessels inspected, 7065; net tonnage, 1,390,389 55; number of officers licensed, 33,237; increase in number of vessels inspected over preceding year, 338; increase in tonnage, 74,953 48; increase in number of officers licensed, 1615. During the year there were 1882 applicants for pilots' licenses, of which number 1738 passed a successful examination for color-blindness and 44 were rejected. There were 34 accidents, resulting in the loss of 245 lives—a decrease of 56 as compared with the preceding year. Of the accidents, 17 resulted from collisions, and 102 of the lives lost were by drowning. Of the number of lives lost, 65 were passengers and 180 were officers or persons employed on the steamers.

HOT WATER ON TAP.—In Paris in districts settled with poor families there are to be found nickel-in-the-slot stands, into which a 5-centime piece (equal to our copper cent) can be dropped, which will allow a button to be pressed that will immediately cause a stream of boiling hot water to flow until nine quarts have been delivered, when it stops. This is found to be a great opportunity for economy with poor families—the cost of hot water so obtained being much less than it would be if a fire had to be made to heat it. Water is thus obtained chiefly for washing. The water is also thus used by Paris hackmen in cans, to keep the feet of their customers warm in cold weather.

MIXING NATIONALITIES.—The present Russian Chancellor is a Swede; the late Persian Ambassador in London was a Scotchman; an Irishman was three times Prime Minister of Spain, and a Celt. MacMahon, was President of France. The Russian Ambassador at Paris is a German, the French Ambassador in London is an Englishman, and the Italian Ambassador in Berlin is a Frenchman. The chief consulting Admiral of the Turkish fleet is an Englishman, as was also the late Admiral of the fleet.

TO CLEAN LACE, fill a bottle with cold water, drew a stocking tightly over it, securing both ends firmly. Place the lace smoothly over the stocking and tack closely. Put the bottle in a kettle of cold water containing a few shavings of soap and place over the fire to boil. Rinse in several waters and then drain and dry. When dry, remove and place smoothly in a large book and press with weights. Very nice lace can be made to look like new by this process.

WATER WASTE.—It is estimated that water leaking through a hole just large enough to pass a needle through, during 24 hours, at a 14-pound pressure, would be sufficient to supply a house for a day. The waste through a one-inch pipe under the same conditions would be 1140 gallons.

AMONG the industries of New York there are women who can make tins, tools, trunks, trusses, harness, saddles, traveling bags, pocket-books, jewelry, coffins, wooden boxes for cigars and grocery supplies.

THE Crosby Steam Gauge and Valve Company of Boston manufacture a chime whistle, which is musical and a great improvement over the harsh and noisy things in use at the present time by many firms.

MIX STOVE BLACKING with spirits of turpentine. It will take off the rust, polish easier, and will stay glossy longer than when water is used.

SCRAP STEEL.—Utilizing scrap-steel rod by welding it and drawing it into fence wire is one of the recent successes of electric welding.

ENGINEERING NOTES.

NEW METHOD FOR SUBMARINE FOUNDATION WORK.—According to a German publication, Herr Fr. Neukirch, in Bremen, Germany, has devised a new method for foundation works which has proved practically valuable by actual application. His object is to solidify sand under water by introducing into it powdered cement by means of compressed air blast. An iron tube, somewhat pointed and perforated at the end, reaches the base of the intended foundation, and is connected, through a rubber hose, with a compressed air plant, and can be lowered end raised by means of a windlass. The area to be covered by the foundation works is divided into greater or smaller parts, according to the desired depth, so that the tube to be inserted in each is sunk in distances varying from 20 to 30 centimeters. The quantity of cement to be deposited changes also in proportion to the depth to be attained, and when calculated is filled with a special iron reservoir through an adjustable funnel, and thus ready to be let into the air current down the tube in a spray-like blast. The strong air current issuing from the holes in the end of the tube facilitates the sinking of this to such an extent that in a pure sand bottom it will penetrate four inches within 30 seconds. On reaching the desired depth, the cement is poured down, and with the air blown into the sand while the tube is being slowly raised. The blast gives rise to a boiling movement of the water and sand whereby the cement is thoroughly mixed with the sand and thus solidifies the bottom. The cement remains hard, just as concrete, during several weeks.

A RAILROAD TO ALASKA is one of the sure things of the near future. The latest information in this direction is that arrangements have been concluded and capital raised by a syndicate of St. Petersburg, Russia, capitalists and some prominent New York railway magnates, among whom are Henry Villard, to build a railroad from Puget Sound to Alaska. There have been many wild transpacific and transatlantic schemes, such as bridging Behring straits and establishing a steamship line to Europe from Hudson's bay; yet none a few years ago appeared more chimerical than the proposition to build a paying railway through the frozen wastes of Alaska. But now considerable interest is manifested in schemes of this kind. Alaska has many enthusiastic admirers who look on it as the coming land of wealth and promise. What Jay Cooke did in booming the Lake Superior country, Villard and his friends propose to do for Alaska. Engineering parties have been in the field all summer, and it is expected that the line will be located next spring. The company has a capital of $1,500,000.

THE PROPOSED TUNNEL BETWEEN IRELAND AND SCOTLAND.—A public meeting, convened by the Mayor of Belfast, has been held to consider a scheme for constructing a tunnel between Ireland and Scotland. Mr. Burton, civil engineer, submitted his scheme, which is to construct a tunnel from the junction of the Belfast & Northern Counties Railway, four miles inland from Whitehaven, on the Antrim coast, to the center of Wiereton Hill, in Wigtonshire, also about four miles inland, the whole length to be about 34 miles. The scheme has the support of Sir Douglas Fox, engineer of the Severn tunnel, Sir Benjamin Baker, the Forth bridge engineer, and Sir John Hawkshaw of London. He estimated the total cost at £8,000,000, and the tunnel could be completed in 10 or 12 years. The meeting passed resolutions recognizing the importance of the scheme, urging the Government to render financial assistance, and appointing a committee to consider and report upon the whole question.

FEATHERING PADDLE-WHEELS.—It is not generally understood, we believe, that feathering paddle-wheels were in use as far back as 1830, when a patent was granted to one Elijah Galloway, and sold by him to William Morgan, and became known as Morgan's wheel. Later a Mr. Seward made some improvements which rendered the operation more satisfactory. There was also tried in 1833 a cycloidal wheel which consisted of dividing the paddle into a number of parts which were placed upon the wheel in the curve of a cycloid, so they entered the water at the same spot and followed one another so rapidly as to cause little resistence and afterward separated to afford full scope for their action in passing the center, and coming out, allowed the water to escape readily from them. That feathering paddles have not been used more often in this country is the occasion of some surprise to English engineers.

A NEW ENGINEERING FEAT.—A divided steel steamer, the Mackinaw, of 2578 tons, has been sent down the canals to Montreal, to be reconstructed there previous to her shipment to New York. The Mackinaw was built at West Bay City, Mich., was taken to the drydock in Buffalo, N. Y., and there cut in two to enable her to pass through the St. Lawrence canals, and she was passed through about 42 canal locks in 11 days. This is the first steamer built on the lakes and thus transferred to the transatlantic trade.

THE amounts appropriated by Congress for Oregon rivers and harbors for the past three congressional terms are as follows: 1886, $598,250; 1888, $1,178,500; 1890, $1,507,100.

MINING AND SCIENTIFIC PRESS.

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W. B. EWER.....SENIOR EDITOR

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Business Announcements.

[NEW THIS ISSUE.]
Delinquent Sale Notice—Gray Eagle Mining Company.
Rock Breaker for Sale—2500 Mission St.
Anti-Incrustation Powder—J. C. Winans.
Situation Wanted—B. C. H., Oakland.
☞ *See Advertising Columns.*

Passing Events.

Among other important events of the past week that failed to occur was the much desired and greatly needed rainfall, nor are we advised as to when it may be expected to put in an appearance. The early rains having been withheld, we await now the later, trusting to the promise that it will not fail to make its advent.

Reports from the mineral regions continue favorable, the prolonged dry weather hurting the mining less than almost any other of our leading interests. To those engaged in river-bed mining, the longer the rain holds off the better. Thus it happens that the Golden Gate Company, operating near Oroville, have, through the continued low stage of the water in Feather river, been enabled to take from their claim astonishing quantities of gold.

The late threatened outbreak among the Indians is likely to reach an early and favorable termination, the promised Messiah having failed his followers on the "grub" question. Truly the way to rule the Redskin is through his physical wants, more especially those that go to supplying his gastric and digestive apparatus. The "braves" continue to quietly feed at "Uncle Sam's" crib.

Electrocution stands in New York, the Supreme Court of the United States finding the law providing for this method of inflicting capital punishment to be both legal and constitutional. A Japanese murderer lying in a New York prison under sentence of death will now be electrocutionized.

The recent attempt at revolution in Honduras has been squelched and the principal revolutes shot.

A People Who Have Much to Be Thankful For.

The late Thanksgiving Day was, throughout California, observed after conventional methods—a little church-going and much gluttony. But if our people, in their eagerness to enjoy the good things of this life, punished a few of the bad ones as well, this must be overlooked. The public gratitude would, on this occasion, have met with heartier expression had the day been preceded by a drenching rain, which, however, it is only safe to pray for on a falling barometer. These appointed Days of Thanksgiving and Prayer must be construed to mean some thanks for favors received and some importunities for favors withheld; thanks at these times being given with some "mental reservation." Mortal man is diplomatic, especially the farmers, as witness their course in the late election.

But, notwithstanding a drouth, protracted beyond the usual limit, the people of California have much for which they should be grateful. They should be grateful for their splendid climate and productive soil; for their gold mines and other well-assured sources of wealth; for their exemption from widespread disease, the cyclones, tornadoes and destructive storms to which their brethren in the East and the inhabitants of most other lands are exposed. Above all should they be thankful for their deliverance from the absurd and tyrannical forms of government that oppress other peoples. They ought to rejoice and be exceeding glad that they live in a country where the hard-fisted "rail-splitter" and the boy driving on the towpath can if deserving be raised to the Chief Magistracy; where there are no established churches or established aristocracy, no privileged classes or humiliating distinctions; where a man can assert his manhood; where there is freedom without license and protection without surveillance; all having the same chance to succeed, all being equal in the eye of the law. These are great blessings and should not fail of due appreciation on the part of those who enjoy them.

"Going West"—What the Term Has at Different Periods Implied.

It is not more than 80 or 90 years since the term "going West" meant, with the people of Virginia, moving over the Blue Ridge; with the people of Pennsylvania, emigrating beyond the Allegheny mountains; while in New York a removal to Genesee valley, about the center of the State, was looked upon as "going West." Later on, emigrating to Ohio, Illinois, Michigan and Indiana, each in its turn was considered "going West," up till about 1840 everything beyond the Mississippi being regarded as "the Far West!"

Since California became the *ultima thule* of westward immigration, it is no longer easy to say just where the "West" is. Practically, the dwellers on this coast have no occident. Where the inhabitants of our Oriental States now locate the "West" we are not advised. We suppose they continue, as of old, to speak of the central group of States as the West, though with us they lie so far to the east. Our geographical nomenclature in this, as in some other respects, calls for amendment. We require at least a new classification of the States. The Republic should be divided into the Northern, Southern, the Middle or Central and the Western States, the latter taking in all west of the Rocky mountains, while the Middle or Central group takes in all between the Rockies and the Mississippi river, except such portion of Louisiana as lies west of that river. The Northern tier of States might properly be made to comprise all the territory north of Virginia and Tennessee.

Grouping the States in the manner here proposed and naming the several groups according to their geographical positions would enable us to fix the "West" somewhat definitely and give to these other subdivisions of the Republic more precision than has been the custom.

The Outlook for Our Various Mining Industries.

There has occurred within the past few months a marked appreciation in the prices of nearly all our mineral and metallic staples. The tendency of the whole market has been upward. Lead, tin, silver, coal, copper, iron and antimony have all advanced from five to ten per cent on former prices; the rates before paid for salt, quicksilver, borax and most other mineral products of minor importance having at the same time been well maintained.

Nor has this upward movement been the result of speculation or an attempt to forestall the market. It has, for the most part, been based on demands incident to increased use and consumption, the supply in many instances having been insufficient to meet requirements. The appreciation has therefore been solid and healthful. It is for this reason all the more gratifying, as it argues for this movement steadiness and permanence. It has grown out of a great industrial activity, and will hold as long as this condition of affairs shall obtain. That it will not be short-lived may be counted upon, now that our home interests and industries are to be well protected against foreign competition.

While this policy on our part may provoke retaliatory legislation in England and elsewhere, it cannot seriously affect our mining and metallurgical industries. These open to our enterprise in China, Japan, Africa, Mexico, Central and South American fields are so vast that we can well afford to dispense with the limited market afforded us in this line, either in Great Britain or on the Continent of Europe. Should Mr. Blaine's plan of reciprocal trade be somewhat extended with the Republics of South America, we would be able to supply them with vast amounts of machinery and other manufactured articles, either exchanging them for the products of these Republics or disposing of them for cash. Brazil and the Argentine Republic, when their affairs, financial and political, shall become a little more settled, will alone take from us more of our surplus products and wares than all Europe. These countries are new and of vast extent—their natural resources being simply astounding. They are destined to develop these resources and increase rapidly in population, rendering their trade an object of the first importance.

Confining our views to our own country, the outlook here is full of encouragement. Railroad construction, shipbuilding and similar pursuits into which iron, copper and lead largely enter, having lately received a decided impetus, it may be expected that the call for these metals will continue large. The promised growth of mining for gold and silver, while it will also absorb much iron, will stimulate quicksilver production to a corresponding degree.

As for copper, its future is especially bright. Although the price of this metal, on the collapse of the French syndicate, met with a sudden and fearful tumble, it has since been restored to almost the highest figure reached during the supremacy of that powerful but overambitious combination. The executors of that body have just disposed of the last of its holdings, and this without creating a ripple on the surface of the market, which could have absorbed much more without causing serious disturbance.

With this menace removed, the copper industry is restored to its normal condition, imparting to the market a steadiness and to the whole business a confidence that for several years before it had not enjoyed. In the future, production and consumption will be likely to go hand in hand. The former will be large. With the prices now ruling, this is inevitable, yet these two factors may safely be left to regulate each other. Requirements for electrical purposes, already large, will be likely to increase enormously hereafter. The employment of the sulphate of this metal in viticulture will furthermore enlarge the field of its usefulness immensely, even though this use be not extended to other plants than vines, as it undoubtedly will be. As an alloy with other metals, copper is all the while growing in importance.

What is said here of copper applies measurably and in a general way to lead, tin, coal, borax and many other of our mineral and metallic products, for all of which the demand, keeping pace with our progress in industrial expansion and population, will rapidly increase hereafter. Upon the whole, it may justly be said that the outlook for the business of mining, considered in a broad sense, may be regarded as very hopeful, fully as much so as that of any of our other leading industries.

Further Silver Legislation.

Probably one of the first subjects that will receive attention from Congress is that of silver. The money stringency at the East has demonstrated beyond the cavil of a doubt that the present law does not meet the business requirements of this country. At the time the bill was passed requiring the purchase of 4,500,000 ounces of silver a month, the MINING AND SCIENTIFIC PRESS took occasion to criticise the bill and stated that it would prove a failure. With a population almost equal to that of both England and France, with an internal trade far in excess of either, and an export trade second in rank, yet the circulating currency of the country is not equal to that of France. No country can expect to be exempt from extreme depressions or extreme high speculative prices which is deficient in money so as to prevent moneyed speculators from unduly depressing or inflating values of leading securities or commodities by making money scarce or plentiful, as desired, to better carry out their schemes.

This statement is well illustrated by the way the late panic in stocks at New York was worked to the advantage of a moneyed few. By making money plentiful and publishing glowing reports of expected large "booms" in all speculative securities, the more credulous of the public bought quite heavily—many loading up beyond their means. With the first ripple of an approaching storm, the capitalists who had not only unloaded but shorted the market began to create distrust by publishing exaggerated reports of the situation and at the same time withdrawing money from the market. The withdrawing of funds created a fictitious scarcity of money, necessitating bankers and large money-lenders to call on their patrons to make their accounts safe. At each call securities had to be thrown on the market, and at each unloading prices gave way still further, until all that could be secured had been given up by outsiders. With this an accomplished fact money began to grow easier and the schemers were ready for another bull movement to unload at a good profit. This is no new way of running corners and deals. It is a notorious fact that the Goulds have done so before in manipulating railroad securities, as have the Armours in running deals in wheat, corn and provisions. It is through these that their colossal fortunes have been acquired.

With silver placed on a footing with gold, no such successful manipulation can be done by the few against heavy losses of the many. For by the free coinage of silver, the price of the metal would at once be advanced to par, and the currency of the country increased to meet the demands of business. Of necessity, free coinage of silver does not signify that it shall be coined at once, for the Mint capacity is not equal to it, but as in the case of gold, Treasury notes be issued against the silver at par value, deposited in the Mints for coinage.

The Next Report of the State Mineralogist.

The Grass Valley Daily *Union*, in speaking of the forthcoming report of Wm. Irelan, Jr., State Mineralogist, expresses the opinion that it will be the most complete of the entire series of reports emanating from the Mining Bureau, an opinion in which we are inclined to concur, as this volume will treat fully of the geology, lithology, minerals, soils, climatology, statistics and general resources of the mineral regions brought under special consideration. The book will contain over 50 maps of different mineral districts, which is a new and valuable feature of these reports. Mr. Irelan has had capable assistants in the field, wherefore he will be enabled to present a report that while it redounds to his own credit, will deeply interest a large class of readers and tend to promote the mining industries of the State. The manuscript for this volume, having for some weeks past been in the hands of the State Printer, is now nearly all in type. The book, which will be ready for delivery early in the new year, is bound to be in great request, especially among the miners. It is to be hoped that a large

edition will therefore be printed, to the end that all requiring it may be supplied. Nor should the edition be restricted to barely enough to meet present requirements. Future wants should be anticipated, to the end that they may be met when they arise.

Of the seven volumes of these reports, all that preceding the last two have been exhausted and are now out of print. Those books at present command high prices, being much sought after, though by no means so valuable as the one now about to issue from the Bureau.

We stated in the columns of the PRESS not long since that we would procure each of the earlier reports of this series as could he had and forward them an application.

This promise we will have to recall, as we find on inquiry that none of these earlier editions are to be had. The later ones—that is, those of 1888 and 1889, constituting the eighth and ninth volumes of the series—can be procured by addressing the State Mining Bureau, San Francisco, California, and inclosing the necessary postage—23 cents for Volume 8 and 11 cents for Volume 9, of which the State Mineralogist has still some copies left.

On Certain Magnetic Rocks Recently Found in Arizona and California.

[A paper read before the San Francisco Microscopical Society, Nov. 19, 1890, by HENRY G. HANKS, F. G. S.]

At Tucson, Arizona, recently, I discovered on the summit of a low, conical mountain, a mile or more from the town, a great quantity of what seemed cellular lava or basalt in broken fragments lying on the surface, specimens of which I have brought this evening for your inspection.

I was led to ascend this hill called "Sentinel Hill" or the "Sugar Loaf" partly by a desire to enjoy a view of the beautiful Santa Cruz valley, partly in search of geological information and to discover the source of the building stone used in Tucson; but more perhaps to study the formation of bowlders and to collect examples of their natural weathering, as observed in California.

The road from the town southwesterly crosses the Santa Cruz river at a distance of about a mile and continues nearly the same distance to the hills or spurs of the Sierra Tucson. Sentinel Hill is an outlier of the range, and rises several hundred feet above the mesa. From a distance the rocky hillsides seem to be destitute of vegetation, but a nearer examination reveals the presence of numerous cacti, long and cylindrical, resembling piles partly driven into the ground; these are the "Cereus giganteus" which give character to the desert hills of Arizona, and are called "Suwarrow" by the Mexicans. Some of them are 16 feet high; they have no sylvan character and add nothing to the beauty of the landscape. Clumps of the curious "opuntia" and a great number of smaller cacti abound.

The road leads up to a quarry of gray stone, which is largely used in the foundations of well-built adobe houses of the town.

When the inhabitants of Santa Cruz valley require building stone in unlimited quantity, the supply will be found ample.

I found the summit literally covered with large angular and sub-angular fragments of dark-colored cellular rock mentioned, fragments of which gave when struck the ringing sound characteristic of phonolite. The study of these rocks is very interesting. The lighter gray variety revealed at the stone quarry partakes somewhat of the character of the so-called "white lava" of California. The sharp high summits of these hills are basalt-like cellular and of a darker color; but a close observation of the two rocks shows them to be the same—either changed, formed or ejected under different conditions.

I am inclined to the opinion that the soil of Santa Clara valley is largely composed of these rocks disintegrated. There is no sign of aqueous formation, but continued observation makes an igneous origin more doubtful. Like Sentinel Hill, Picacho and Desert peaks seem to be of this formation.

Above the gray stone may be seen a breccia of the same rock united by a calcareous cement, apparently an infiltration or deposit from a mineral spring or springs; the analysis shows the source of this lime.

A short distance from the summit I noticed what seemed to be slate, but a closer examination showed the rock to be the same, but rendered slaty by pressure. I noticed also that the air-cells were elongated in a direction at right angles with the pressure; this proved to my mind that the rock must have been plastic. At the risk of being criticised, I admit my doubts as to the igneous or even Plutonic origin of these rocks, although I believe they would be generally so classed, and until I have some new evidence to the contrary, I shall believe them to be metamorphic sediments. My reasons for holding this opinion cannot be stated in a few words, nor are my investigations complete. A detailed dissertation on the lithological character of these extremely interesting rocks would be foreign to the purpose of this paper, which is to call attention to their polar magnetism.

On the road to the summit, the same disposition to weather into spherical forms was seen, as frequently observed in California and elsewhere; the hillsides were covered with globular pebbles of the phonolitic rock, so numerous that they were the rule rather than the exception. I have brought a typical specimen this evening for your inspection. Examples of howlder weathering are so common at this locality that no unprejudiced mind would venture to gainsay the theory of their formation.

On the following day, while examining the basaltic fragments, I held one of the largest to the needle of my compass, and was much surprised to see it repelled instead of attracted. Realizing instantly that I held in my hand a natural magnet, I reversed the specimen and saw the needle strongly attracted.

These unexpected results led to a critical examination of the mineral; it was not magnetite, but a genuine rock specimen resembling basalt. A polar basalt being new to me, I began on my return to San Francisco a thorough reference to authorities in my library, but failed to find any allusion to such a property in basalt or any similar rock.

Spallanzani, in a description of his ascent of Etna, mentions a black, scoriaceous lava, the dust of which "copiously adhered to the point of a magnetized knife, and small pieces put the magnetic needle in motion at the distance of two lines." But if these rocks were polar, like those of Sentinel Hill, he did not discover it.

It is well known that metallic iron occurs in basalts in Bohemia and Greenland. Daubree thinks this iron was brought up from the interior of the earth with the basalts during eruption. Iron is plentiful in the basalts of Disco Island, on the western coast of Greenland, but I have no information of its being formed into bands possessing polarity, which may be the cause of the remarkable properties noticed in the Tucson rocks. When this polarity was thus discovered, a crucial experiment was made as follows: The large piece which I exhibit this evening was floated in an evaporating dish placed in a larger one filled with water. After several hours the magnetic poles of the rock fragment had moved to coincide with the magnetic meridian of the earth, in obedience to the subtile, invisible spirit which lurks among the stony particles.

A remarkable meteorite was found many years ago 20 miles from Tucson, and eight miles from the road to Tubac. United States Commissioner Bartlett, who visited Tucson in July, 1852, saw it in a blacksmith's shop used as an anvil. It was of metallic iron, weighing about 600 pounds. Its greatest length was about five feet. It was figured on Fol. 298, Vol. 2, personal narrative. Bartlett was informed that there were larger pieces at the same locality. There were other masses in the town also at the time of his visit. The first mentioned meteorite is now, I believe, in the Smithsonian Institution at Washington. These facts may have some significance in this connection.

The rock from the quarries is compact, and breaks easily with conchoidal fracture. The basalt-like, overlying cellular rock in general appearance resembled the so-called andesite of the deep gravel mines of Plumas and Sierra counties in California. When long exposed to the elements the outer surface is to a certain extent weathered and metamorphic to a depth of from three to five millimeters. The air-cells vary from several inches in length to very minute ones.

In some cases signs of metamorphism may be seen on the crateriform margins of the broken cells, specific gravity, 2.288, easily pulverized, dull, color red-gray, streak lighter, hardness, 6 (scratches and is scratched by a crystal of orthoclase), cellular, polar magnetic, powder not attracted by bar magnet except a few particles; does not decompose water in presence of sulphuric acid. B. B. rather large fragment fuses of edges to a gray, glassy slag, which is not magnetic; gives water in closed tube.

Under a low power objective, the surface is seen to be peppered with small amorphous particles of dark color, resembling magnetite, or meteoric dust. When a small surface specimen (itself a perfect natural magnet) is presented to the needle, the deflection both attractive and repulsive is found to be greater in proportion to size than that caused by the larger one from which it was broken. I am preparing rock sections, the microscopic study of which promises to be of great interest. A fragment weighing 4.5 grams deflects the needle five degrees, while the larger one weighing 820 grams moves it but 20 degrees. The attraction of the large specimen is felt in the compass at a distance of 17 inches.

Microscopically examined, the rock is crypto-crystalline, light-colored on broken surface, nearly white on weathered face. On the fresh fracture an amethyst-colored mineral and a glassy feldspar may be observed. The vesicles and cellules are not generally internally coated with other minerals, although there are some exceptions.

A chemical examination has the following results: The rock contains silica, 54.80; lime, 6.34; oxide of iron and alumina (alumina doubtful), 26.60; water (loss by ignition), 1.80. With the exception of the silica, lime and loss by ignition, the results were too quickly obtained to be more than approximate. A very careful analysis will be made in the future.

I carefully subjected all the igneous and plutonic rocks in my collection to the test, but only those obtained near Laporte, in Plumas county, California, proved to be polar. A few from other Pacific Coast localities were slightly magnetic, but none of those from Ætna, Vesuvius, Mauna Loa or other noted volcanoes seemed to affect the magnetic needle in the slightest degree; but that some rocks of Plumas county are polar materially broadens the field and adds interest to this subject. These rocks are generally considered as andesite; darker colored ones containing olivine are classed as basalt, but as they generally merge into each other, it is not easy to draw a line of demarkation. I can now trace a resemblance between the polar rocks of Arizona and California at the localities mentioned, but those of our State are not generally cellular and the attraction and repulsion are not nearly so apparent in them as in those from Tucson.

The field of inquiry opened by these discoveries affords a rare opportunity for investigation. It will be particularly interesting (knowing that the great mineral belts bear generally with the magnetic meridian) to inquire if this polarity is inherent in the rocks or is imparted to them by terrestrial currents, and what influence these attractions may have on the deposition of metals in mineral veins.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING NOV. 18, 1890.

440,837.—EXERCISING DEVICE FOR MUSICIANS—E. S. Bonelli, S. F.

440,736.—SEED-PLANTER—R. E. Brakey, Ventura, Cal.

440 838.—HOSE REEL—R. S. Chapman, S. F.

440,839.—TICKET PUNCH—A. W. Coffin, S. F.

440,769. —NUT LOCK—A. A. Dickie, Suisun, Cal.

440,948.—KNIFE CLEANER AND POLISHER—T. A. Evans, S. F.

441,061.—LEVER FOR MOVING CARS, ETC.—W. H. Garlock, Seattle, Wash.

440,843. —THRASHER AND CLEANER—G. W. Haines, Stockton, Cal.

440,846.—LOCK—H. O. Hooper, S. F.

440,864.—STEAM JOINT—H. T. Knight, South Riverside, Cal.

440,829.—GUARD FOR GANG EDGERS — Jos. Korbel, S. F.

440,867. — VEHICLE RUNNING GEAR—J. W. Leete, Carson, Nev.

440,831.—SECURING EXTRA LEAVES IN BOOKS—J. T. McKean, Santa Cruz, Cal.

440,921.—EXPLOSIVE—D. Mindeleff, S. F.

440,830.—TREATING COAL TAR—A. L. Munson, Oakland, Cal.

440,749.—GUARD FOR CARS—G. Rischmuller, S. F.

440,832.—COMPOSITION FOR PROTECTING PILES—James Rowe, S. F.

441,040.—CABLE RAILWAY CROSSING—P. Somerville, S. F.

440,932. — MAIL-BAG—C. P. Tatro, Spokane Falls, Wash.

440,853.—GATE—C. W. Thompson, Tomales, Cal.

440,675.—STAMP-CANCELING MACHINE—S. B. Whiteside, Los Angeles, Cal.

440,835.—STENCIL-CUTTER—J. F. Wickman, S. F.

20,340.—DESIGN — N. A. Wheeler, Alpowa, Wash.

The following brief list by telegraph for Nov. 25, will appear more complete on receipt of mail advices:

California—John Ellis, Stockton, vise pipe-tongs; John T. Grant, San Jose, harrow; John C. Jones, Napa, fermenting tank wine-strainer; Robert Simpson, Hanford, cultivator; George W. and F. P. Stedman, S. F., suspension bridge; Edward D. Stodder, S. F., wave-power motor; Isaac F. Thompson, assignor of one-half to W. L. Palmer, S. F., cut-off valve gear.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TICKET PUNCH.—Arthur W. Coffin, S. F. No. 440,839. Dated Nov. 18, 1890. This punch belongs to that class in which the amount paid by the passenger is indicated upon the ticket by means of punch marks made by the conductor before delivering the ticket to the passenger, while a duplicate of the ticket is retained within the case of the punch as a check. It consists of a circular support rotating within the case and having a series of punches or indicators arranged around its periphery, a means for turning this movable punch-carrier to bring any figures which may be desired into line above the tickets, and a lever device for depressing the desired punches to mark the ticket.

GUARD FOR GANG-EDGER. — Joseph Korbel, S. F. No. 440,829. Dated Nov. 18, 1890. The object of this guard is to prevent injury to workmen who, in the operation of gang-edgers, frequently have their hands and arms drawn in by the feed rollers and badly mutilated. The guard consists of a supplemental roller journaled in front of the upper feed roller and rotating in an opposite direction. This roller is of smaller diameter than the feed roller, so that the lumber will not come in contact with it, and it will, therefore, in no way influence the feed. It is, however, so near the surface of the lumber that if by accident the workman's hands approach too near, the outward rotation of the guard roller will prevent them from being carried into the machine.

STENCIL-CUTTER.—James Frederick Wickman, S. F. No. 440,835. Dated Nov. 18, 1890. The essential novelty in this machine lies in the punch which has its cutting face on a bevel or slope beginning to a point, and its edges terminating separately in about a vertical plane, and in different horizontal planes. The object of this construction is to effect a shear-cut in connection with a flat-faced die on which the material rests. The cutters are all arranged about the periphery of a plate, below which is a similar plate carrying the dies. A presser-arm above is adapted to force the punches down, and means are provided for adjusting the plates to admit and remove the material. The machine is a simple and serviceable one, the punch of which is adapted to cleanly cut the material with the exercise of but little power.

PROCESS OF TREATING COAL TAR.—Anson L. Munson, Oakland, Cal. No. 440,830. Dated Nov. 18, 1890. The purpose of this process is to make from coal tar a quick drying oil which may be used as a vehicle for paints. The coal tar is first subjected to a certain heat, and has then added to it a saturated solution of chloride of zinc and oil of turpentine. In the operation, the heat is maintained without driving off the lighter volatiles, and until the solids are melted to a degree sufficient to be acted upon by the solvents. The chloride of zinc is added, and the mass agitated, and during the agitation the oil of turpentine is added and the mixing continued until the turpentine is thoroughly incorporated. The tar thus treated is permanently changed into a limpid oil. The chloride of zinc acts as a deodorizer, neutralizes the acids, and is a partial solvent. The oil of turpentine is the solvent for the whole. The oil thus obtained readily combines with metallic or mineral substances to form a quick drying paint of great beauty and durability which may be used as a marine paint, and for iron and wood protective coatings, and other purposes.

DEVICE FOR SECURING EXTRA LEAVES IN BOOKS.—John T. McKean, Santa Cruz, Cal. No. 440,831. Dated Nov. 18, 1890. This device is especially applicable for securing extra leaves in hooks which are already bound, these leaves being used for taking notes, advertising and other purposes and being removable or interchangeable at pleasure. It consists in a series of flexible threads or filaments passing through the folds of the supplemental leaves, and a means for attaching the threads at opposite ends.

UNIVERSAL STEAM JOINT.—Henry T. Knight, South Riverside, Cal. No. 440,864. Dated Nov. 18, 1890. This joint is especially applicable to pipes for the transmission of steam or fluid under pressure where it is necessary to change the direction from time to time. It is useful in quarries and other places where the engines are frequently moved from one place to another, while the boiler remains in one position. It avoids the customary use of lengths of hose which are somewhat expensive and are burnt out quickly, thus necessitating constant and expensive renewals. The joint consists of a body having four openings, two of which are closed by screw caps, while the remaining two have their inner ends beveled or expanded, rotary sleeves at right angles with each other, and their inner ends expanded and fitted in the expanded ends of the openings, screw caps fitted to the extended ends of the body, and packing rings within the screw caps fitting against the ends of the extensions.

HOSE REEL.—Rockwell S. Chapman, S. F. No. 440,838. Dated Nov. 18, 1890. This reel belongs to that class adapted to be permanently secured to the walls of buildings in convenient positions whereby the hose wound thereon can be drawn off for use in case of emergency. The invention consists in the novel rotary joint by which the water connection is effected, and also in the guiding device on the front of the reel for directing the hose properly in any direction when being drawn off. The joint is a simple and effective one, admitting of the rotation of the hose reel, and is self-tightening. The guides are rollers neatly and serviceably placed, to direct the hose without friction.

TRAVELING THRASHER AND CLEANER. — George W. Haines, Stockton, Cal. No. 440,843. Dated Nov. 18, 1890. The object of this invention is to improve the cleaning mechanism of traveling harvesters or other thrashers and cleaners by a peculiar construction and operation of the shoe which carries the sieves, and a means for changing the motion from a plain end shake to a combined end shake and vertical tossing motion, the amount of this motion being regulated to suit the quality of the grain while the machine is running. It also relates to an improved construction of chain driving and sprockets, by which the power is transmitted from the main driver by a single chain and distributed from this to the thrashing and the separating and cleaning parts of the apparatus.

LOCK.—Henry Otis Hooper, S. F. No. 440,846. Dated Nov. 18, 1890. This invention relates to that class of door-locks which are also used to latch the door without locking it. It consists of a reciprocating latch bolt and knob, which may be turned to withdraw the latch and open the door; and in connection with these of a hollow spindle, sleeve and locking devices which are operated by a key introduced through a small opening in the knob, so that the latch bolt is prevented from being withdrawn, and then serves as a lock for the door.

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Cast Steel Castings and Steel Forgings
UP TO 20,000 LBS. WEIGHT.
True to pattern and superior in strength, toughness and durability to Cast or Wrought Iron in any position or for any service.
GEARINGS, SHOES, DIES, CAMS, TAPPETS, PISTON-HEADS, RAILROAD and MACHINERY CASTINGS of Every Description.
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HOMOGENEOUS STEEL, SOFT and DUCTILE,
SUPERIOR TO IRON FOR
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ALSO Steel Rods, from ¼ to 3 inch diameter and Flats from 1 to 8 inch. Angles, Tees, Channels and other shape Steel Wagon, Buggy, and Truck Tires, Plow Steel; Machinery and Special Shape Steel to size and lengths **STEEL RAILS** from 12 to 45 pounds per yard. ALSO, **Railroad and Merchant Iron,** Rolled Beams, Angle, Channel, and T Iron, Bridge and Machine Bolts, Lag Screws, Nuts, Washers, Ship and Boat Spikes; Steamboat Shafts, Cranks, Pistons, Connecting Rods, etc. Car and Locomotive Axles and Frames, and Iron Forgings of all kinds, Iron and Steel Bridges and Roof Work a Specialty.
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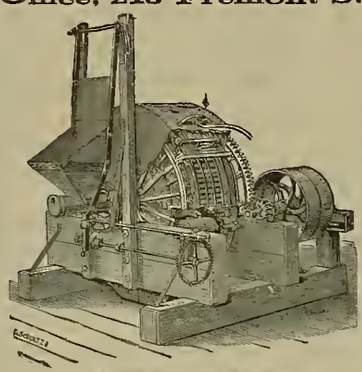
Office, 213 Fremont St., San Francisco.
—MANUFACTURERS OF—



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MARINE ENGINES AND BOILERS.—Propeller Engines, either High Pressure or Compound, Stern or Side-wheel Engines.
MINING MACHINERY.—Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.
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WORKS ORE WET OR DRY.

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Water Pipe, Pump or Air Columns, Fish Tanks for Salmon Canneries
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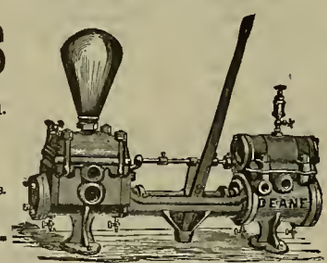

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Of Different Strengths as Required.
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JUDSON POWDER IMPROVED.
FOR RAILROADS AND LAND CLEARING. Is from three to four times stronger than ordinary Blasting Powder, and is used by all the Railroads and Gravel Claims, as it breaks more ground, pulverizes better and saves time and money. It is as dry as the ordinary Blasting Powder and runs as freely.
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Iron cut, punched and formed, for making pips on ground. All kinds of Tools supplied for making Pipe. Estimates given. Are prepared for coating all sizes of Pipe with a composition of Coal Tar and Asphaltum.

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A specialty. Round, slot or hurred slot holes. Genuine Russia Iron, Homogeneous Steel, Cast Steel or American planished Iron Zinc, Copper or Brass Screens for all purposes. California Perforating Screen Co., 145 & 147 Beale St., S. F.

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Hoisting Engines, Safety Cages, Safety Hooks,

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Sectional Machinery FOR MULE-BACK TRANSPORTATION.

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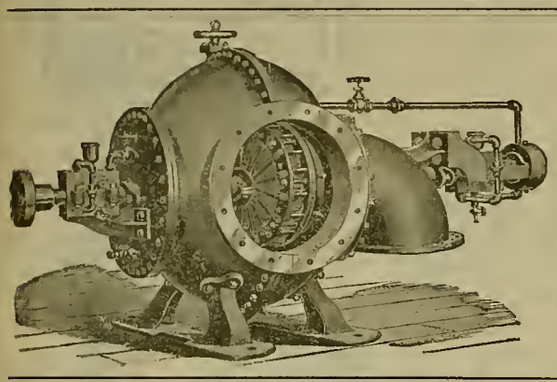

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These Wheels are designed for all purposes where limited quantities of water and high heads are utilized, and are guaranteed to give more power with less water than any other wheel made. Being placed on horizontal shaft, the power is transmitted direct to shafting by belts, dispensing with gearing.

Estimates furnished on application for wheels specially built and adapted in capacity to suit any particular case.

Further information can be obtained of this form of construction, as well as the ordinary Vertical Turbines for Wooden Penstocks and in Iron Globe Cases, free of cost, by applying to the manufacturers.

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ANNUAL CAPACITY 800. ESTABLISHED 1831.

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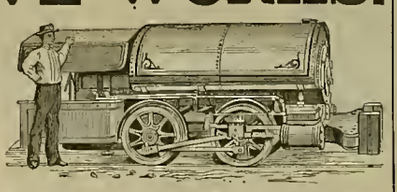

Adapted to every variety of service, and built accurately in standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Broad and Narrow Gauge Locomotives, Mine Locomotives by Steam or Compressed Air, Plantation Locomotives, Noiseless Motors for Street Railways, Furnace Locomotives, etc.

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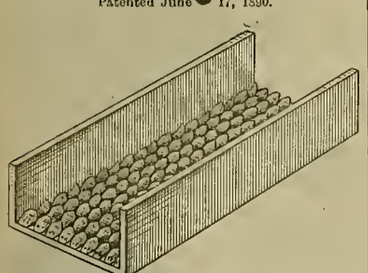

A NEW DEVICE TO BE USED ON TABLES FOR Gravel Mills and Undercurrents to Hydraulic Claims. When used in quartz mills it is equal to silvered plates. It is simple and economical in its construction and practical in its operation. Send for circulars. CHAS. TRAFTON, Yankee Jim's, Cal.

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Beats them all. Works dry ores. Makes even granulation. No dead work, hence minimum wear.
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The very best. Uses no water. No freezing up. Saves hauling waste. Saves high percentage. Send for circulars.
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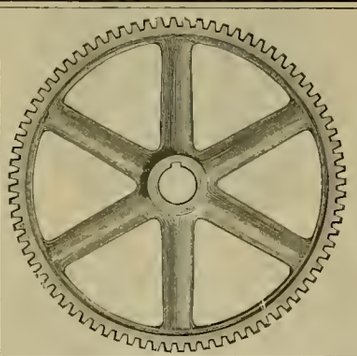

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Patent Models

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DRAWINGS, PLANS and SPECIFICATIONS made for new machinery.

Jobbing of every description promptly attended to. FINE WORKMANSHIP GUARANTEED.

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Ores Received on Consignment, Sampled, Assayed, and Disposed of in the Open Market to the Highest Bidder.

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GOLD AND SILVER REFINERY
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Highest Prices Paid for Gold, Silver and Lead Ores and Sulphurets.

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BLUESTONE,
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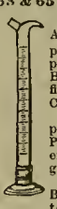

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods, both as to quality and price.

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NO. 23 STEVENSON STREET,
Near First and Market Streets, S. F.

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Ores worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, etc.
Working Tests (practical) Made.
Plans and Specifications furnished for the most suitable Process for Working Ores.
Special attention paid to Examinations of Mines; Plans and Reports furnished.

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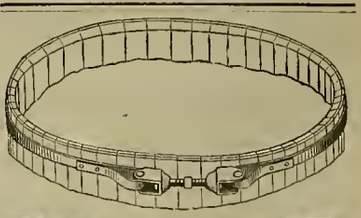

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Malleable Iron. All Sizes.

These Couplings are the best in the world, most powerful and cheapest. They have a ball and socket joint, right and left screw and work freely. We use them extensively in our Tank Building Department.

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Mechanics' Mills, Cor. Mission & Fremont Sts., S. F.

THE RUSSELL PROCESS.

For information concerning this process for the reduction of Ores containing precious metals, and terms of license, apply to

THE RUSSELL PROCESS CO.,
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Rooms 21 and 22,
Telephone No. 5057. SAN FRANCISCO.

DEWEY & CO., PATENT AGENTS, 220 Market St., San Francisco. Elevator, 12 Front St.

Market Reports.

Local Markets.

SAN FRANCISCO, Nov. 26, 1890.

General trade the past week was quiet—continued dry weather, tbe boliday season and tbe unsettled condition of affairs at tbe East being against the market. During tbe stringency at New York over $4,000,000 was transferred from tbis city to New York througb the Treasury. This is independent of large sums remitted tbe usual way. With an easy money market at the East, money is beginning now to set this way. Australia continues to send us large quantities of sovereigns for exchange purposes. The sovereigns are melted by the Mint and recoined as soon as received.

The demand for money is slow, but a more active inquiry is expected to obtain in next month for tax purposes and also for annual settlements, interest and dividends.

Eastern advices indicate that tbe stock panic is virtually over, and that large moneyed operators are preparing a program for a bull movement in tbe market.

MEXICAN DOLLARS—The market is dull at 81@82c. The coining of dollars by the Chinese Government and making them legal tenders will probably be against the shipping of Mexican dollars to that country.

SILVER—On last Wednesday, Nov. 19th, tbe price of silver fell in New York to 96¼ cents an ounce, hut reacted by small jumps up to $1.03, at which price it sold on Monday. Many English papers to hand stated tbat the success of the Democratic party in the United States was thought to be the forerunner to adverse legislation, and acting under tbis impression holders sold at declining prices. While the above opinion prevailed in England, in tbis country the success of the Democrats caused bimetallists to look with certainty upon a free coinage hill. The ignoring by the last Congress of farmers and labor unions' petitions asking for the free coinage of silver, undoubtedly led to the defeat of the dominant party; for the issue in the Central, Middle and Southern States was bi-metallism and lower tariff. There are many in position to know who affirm that the Republican majority may pass a free coinage of silver bill before the next session of Congress begins, so as to take the wind out of the Democratic sail. As a stroke of policy on their part it would be the very best. A press telegram reports that the Chancellor of tbe Exchequer will recommend the issuing hy the Bank of England of £1 notes based on silver. The bank can if disposed keep a portion of its reserve in silver. If it adopts the reported recommendation of Mr. Goschen, then a decided forward step has been made looking to bi-metallism. China is coining silver dollars, which will call for silver bullion.

QUICKSILVER—Receipts the past week aggregate as follows: Coast 160 flasks, overland 10. The exports aggregate 200 flasks to Mexico. The market is steady at unchanged quotations.

BORAX—Receipts the past week aggregate 418 ctls. The market is reported steady, with a good demand ruling at the East at full prices.

LIME—Receipts the past week aggregate 3760 bbls. The home demand continues steady, although, owing to the lateness of the season, buyers, it is said, confine tbeir purchases to immediate requirements.

LEAD—The market, which exhibited signs of lower prices, has gained slightly in strength. Large dealers do not look for much if any lower prices. Many believe tbat a higher range will rule after the turn of the year.

TIN—Imports the past week aggregate 433 ingots from Australia. The market for pig is still offisb, buyers not taking beyond immediate requirements. In plate, spot trading is slow; for delivery before the higher duties take effect there has been fair business. It is said that heavy purchases bave been made to arrive.

COPPER—The market is reported steady witb a strong tone. The strength to the market is due to the steady decreasing stocks under free consumption.

IRON—The market in all positions is quite firm. The strike in Scotland caused many furnaces to go out, resulting in a strong and bigher market. The advance abroad makes the Eastern market the lowest for shipments to this port. Imports the past week aggregate 105 tons of Oregon.

COKE—Imports the past week aggregate 414 tons from Newcastle, England. The market is firm at full prices for shipment, to arrive and on spot.

COAL--Imports tbe past week aggregate as follows: From Nanaimo, 4648 tons; Liverpool, 2900; total, 7548 tons. As there are quite a number of vessels on the way and to arrive from coast ports, receipts ought to show quite an increase from now on. The southern part of the State is being supplied by coal from localities in adjoining Territories. Wyoming coal is coming in more freely to points north and west of us. These deliveries cut off quite a demand on this port for coal, and in lessening the distribution points, import dealers here have a better opportunity of meeting the near-by demand. The financial troubles of the Oregon Improvement Co. will not affect the supply from their mines, as a receiver is in charge and work will continue as usual. Australian advices report that tbree vessels have sailed and that other vessels will receive quick dispatch.

Coal and Coke.

SPOT FROM YARD—PER TON		TO LOAD—PER TON.	
Wellington	$14 00	Australian	$ 75@—
Greta	14 00	Liverpool Sm.	50@—
Carbon Hill	9 00	Scotch Splint	50@9 00
Nanaimo	11 00	Cardiff	50@—
Gilman	11 00	Lehigh Lump	16 50@17 00
Seattle	11 00	Cumberland bk	13 50@—
Coos Bay	11 00	Egg, hard	15 00@—
Cannel	16 00	COKE—ENGLISH.	
Egg, hard	16 00	To load	$12 00@13 00
Cumberland, in sacks	19 50	Spot, in bulk	16 00@18 00
do. bulk	18 00	All spot quotations subject	
Wallsend	13 00@14 00	to change without notice.	

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Baker Divide & M Co	California	18	20	Nov 17	Dec 8	D M Kent	330 Pine St
Confidence Silver M Co	Nevada	17	75	Nov 17	Dec 22	Jan 12	A S Grotb	414 California St
Con Imperial M Co	Nevada	29	5	Oct 15	Nov 15	Dec 3	C L McCoy	331 Pine St
Con New York M Co	Nevada	4	15	Nov 12	Dec 17	Jan 6	C E Elliott	309 Montgomery St
Gray Eagle M Co	California	20	6	Oct 20	Nov 24	Dec 15	J M Buffington	303 California St
Guasacarau & Cal M & M Co	Honduras	3..10	00	Oct 28	Nov 28	Dec 16	Edward Oliver	22 Michigan Ave, S F
Hale & Norcross M Co	Nevada	96	50	Oct 7	Nov 12	Dec 3	A B Thompson	309 Montgomery St
Mexican G & S M Co	Nev. da	41	25	Oct 16	Nov 20	Dec 10	C E Elliott	309 Montgomery St
Mono G M Co	California	30	25	Sept 18	Oct 28	Dec 2	E L Burling	309 Montgomery St
Morgan M Co	California	14	10	Oct 30	Dec 6	Dec 29	L C Bresse	230 Montgomery St
Northwestern G & S M Co	Br Columbia	1	5	Nov 12	Dec 19	Jan 15	E Bonacina	438 California St
Russell Reduction and M Co	California	7	5	Nov 17	Dec 8	J Morizio	328 Montgomery St
Seg Belcher & Mides Cons Co	Nevada	7	25	Oct 7	Nov 10	Dec 1	E H Holmes	309 Montgomery St
Silver Hill M Co	Nevada	27	20	Oct 3	Nov 13	Dec 3	D C Bates	309 Montgomery St
Trinity River T & M Co	California	3	30	Oct 6	Nov 17	Dec 8	Edwin L Griffith	28 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Mexican G & S M Co	Nevada	C E Elliott	Nevada Block	Annual	Dec 2

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Commonwealth M Co	Nevada	R R Grayson	331 Pine St	20	Nov 20
Eureka Cons M Co	Nevada	H P Bush	308 Pine St	25	Aug 5
Pacific Borax Salt & Soda Co	California	A H Clough	250 Montgomery St	1 00	Nov 10

San Francisco Metal Market.

WHOLESALE.
WEDNESDAY, November 26, 1890.

ANTIMONY		— @	21
BORAX—Refined, in carload lots		8 @	—
" Powdered " " "		8 @	—
" Concentrated " " "		7½@	—
All grades jobbing at an advance.			
COPPER—			
Bolt		23 @	25
Sheathing		23 @	25
Ingot, jobbing		20 @	—
do, wholesale		18 @	16½
Fire Box Sheets		23 @	25
LEAD—Pig		5½@	6
Bar		6½@	6½
Sheet		7½@	—
Pipe		7 @	—
Shot, discount 10% on 500 bags	Drop, ₱ bag.	1 90 @	—
Buck, ₱ bag		2 10 @	—
Chilled, do		2 30 @	—
QUICKSILVER—By the flask		53 50 @	54 00
Flasks, new		@	—
Flasks, old		45 @	55
CHROME IRON ORE, ₱ ton		10 00 @	—
STEEL—English, lb		16 @	20
Canton tool		9 @	9
Black Diamond tool		9 @	9
Pick and Hammer		8 @	10
Machinery		4 @	5
Toe Calk		4½@	—
TINPLATE—B. V., steel grade, 14x20, to arrive		— @	—
B. V., steel grade, 14x20, spot		6 12½@	6 25
Charcoal, 14x20		6 50 @	—
do roofing, 14x20		6 00 @	—
do, do, 20x28		13 00 @	—
Pig tin, spot, ₱ lb, nominal		23½@	24
IRON—Bar, base		3 @	3½
Norway, base		4½@	5½

IRON—Glengarnock ton	Spot.	To Load.
	34 00 @—	30 @ —
Eglinton, ton	34 00 @—	30 @ —
American Soft, No. 1, ton	— @32 00	30 @ —
Oregon Pig, ton	— @33 00	— @ —
Puget Sound	34 00 @—	— @ —
Bar Iron (base price) ₱ lb	— @	— @ —
Clay Lane White	— @28 00	26 @ —
Shotts, No. 1	34 00 @35 00	32½@ —
Langloan	34 00 @—	30 @ —
Thorncliffe	34 00 @—	30 @ —
Gartsherrie	34 00 @—	30 @ —
Barrow	34 00 @—	30 @ —
Thomas	33 00 @—	— @ —
Cargofleet	30 00 @—	26 @ —

Sales at San Francisco Stock Exchange.

WEDNESDAY, November 26, 9:30 A. M.

100	Alpha Con	1.30@1.35	
300	Alta	1.15	
450	Andes	1.10	
100	Belch-r	2.35	
100	Best & Belcher	2.75	
150	Bullion	2.45	
600	Caledonia	40@45c	
250	Occ Dental	20@50c	
50	Challenge Con	2.60	
150	Chollar	3.60@3.65	
100	Con Cal & V	3.75	
300	Con Imperial	30@35	
200	Con Pacific	15c	
100	Crocker	20c	
350	Crown Point	2.25	
150	Exchequer	90@95c	
250	Gould & Curry	1.90	
430	Hale & Norcross	2.10	
200	Kentuck	35c	
100	Lady Wash	35c	
500	Locomot've	5c	
100	Mexican	2.75	
200	Occ dental	1.15	
150	Ophir	4.60	
250	Overman	2.50@2.55	
100	Potosi	6.87½	
250	Savage	2.40	
50	Scorpion	20c	
100	Seg. Belcher	1.45	
400	Sierra Nevada	2.25@2.30	
200	Utah	80c	
200	West Comstock	60c	
30	Yellow Jacket	2.60	

Eastern Metal Markets.

By Telegraph

NEW YORK, November 26.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	45½	99½	$16 50	$4 80	$20 60
Friday	46½	1 00¾	16 50	4 85	20 70
Saturday	46¾	1 02	16 50	4 85	20 70
Monday	47¼	1 03	16 50	4 80	20 90
Tuesday	47	1 02½	16 50	4 80	20 80
Wednesday	....	....	....	....	....

NEW YORK, November 25.—The unsettled condition of the money market is still an important factor in keeping the metal market in a more or less demoralized condition, causing correct quotations to be difficult to obtain. At the close a steadier feeling is setting in, which will probably assert itself after the present week.

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

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WANTED. A MAN WITH SOME KNOWLedge of practical and analytical chemistry wishes employment in a laboratory, metallurgical works, fertilizer factory, mine, or something of that character. Address B. C. H., 2133 Elm Street, Oakland.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 6.		WEEK ENDING Nov. 13.		WEEK ENDING Nov. 20.		WEEK ENDING Nov. 25.	
Alpha	1.75	1.95	1.50	1.80	1.10	1.40	1.25	1.35
Alta	1.40	1.45	1.15	1.50	.90	1.25	.95	1.10
Andes	1.70	2.15	.85	1.60	.80	.95	.85	1.15
Belcher	2.70	2.95	2.20	2.65	1.80	2.20	1.90	2.45
Best & Belcher	3.10	3.30	2.70	3.30	2.35	2.75	2.40	2.85
Bullion	2.95	3.40	2.70	3.25	2 15	2.60	2.35	2.60
Bodie Con	1.95	2.30	1.10	1.90	.65	1.25	.75	.90
Bulwer	.40	.50	.30	.40	.20	.40	.20	.25
Consonnowealth	.65	....	2.50	2.85	2.50	2.65	2.30	....
Con. Va. & Cal	4.20	4.50	3.60	4.45	3.35	3.85	3.60	3.90
Challenge	2.90	3.10	2.60	3.25	2.10	2.60	2.10	2.70
Chollar	3.00	3.80	3.25	3.60	3.35	3.80	3.45	3.70
Confidence	7.00	7.37	7.00	7.37	4.25	6.75	4.85	5.50
Con Imperial	.35	....	.25	.35	.25	.30	.25	.30
Caledonia	.45	.50	.35	.45	.25	.30	.30	.35
Crown Point	2.55	2.75	2.20	2.55	1.65	2.20	1.70	2.15
Crocker	.30	....	.25	.30	.20	....	....	....
Del Monte	.70	....	.55	.60	.60	.70	.60	....
Eureka Con	4.00	....	3.50	4.00	3.60	....	3.75	....
Exchequer	1.15	1.30	1.10	1.20	.70	.95	.75	.85
Grand Prize	....	.30	....	.25	.30	.25	.30	....
Gould & Curry	2.20	2.30	1.95	2.30	1.55	2.00	1.65	1.85
Hale & Norcross	1.80	2.00	1.75	2.40	1.95	2.20	1.95	2.20
Julia	.25	....	.25	.30	.15	.25	.15	.20
Justice	1.45	1.50	1.35	....	1.05	1.25	1.10	1.30
Kentuck	1.90	2.05	1.65	1.90	1.10	1.45	1.30	1.55
Lady Wash	....	.35	....	.40	.30	.35	.25	.35
Mono	1.00	1.25	.65	.80	.40	.65	.50	.60
Mexican	2.85	3.05	2.50	2.95	2.15	2.50	2.45	2.90
Navajo	....	....	....	....	.30	.40	.30	.35
North Belle Isle	1.45	1.50	1.35	1.50	1.10	1.30	1.20	1.25
New Queen	.90	....	.85	1.10	.85	.90	.90	....
Occidental	1.75	1.85	1.10	1.75	.90	1.15	1.00	1.20
Ophir	4.50	4.65	3.80	4.40	3.60	3.80	3.70	4.00
Overman	2.20	2.50	2.00	2.25	1.65	1.95	1.65	2.00
Potosi	6.25	7.87	7.00	7.50	6.25	7.00	6.62	7.00
Peerless	.35	....	.30	....	.15	.20	.20	.25
Rescue	....	....	.25	....	.25	.20	.20	....
Savage	2.85	3.10	2.35	2.95	2.00	2.40	2.05	2.45
Sierra Nevada	2.95	3.15	2.30	2.95	2.05	2.45	2.05	2.35
Silver Hill	.20	....	.20	.35	.25	.30	.30	.35
Scorpion	.25	....	.25	....	.20	....	.20	....
Union Con	2.80	2.90	2.20	2.80	2.05	2.30	2.10	2.30
Utah	1.00	1.10	.80	1.05	.65	.80	.65	.85
Yellow Jacket	3.00	3.15	2.45	3.00	2.10	2.50	2.15	2.60

* Assessment de inquent.

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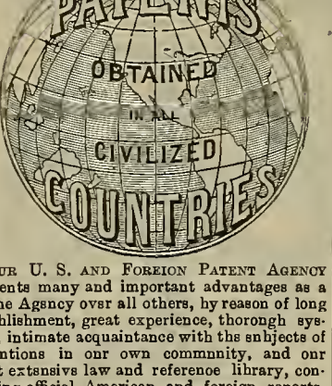

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Notice—There are delinquent upon the following described stock, on account of Assessment (No. 20) levied on the 20th day of October, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Buffington, J M, Trustee	528	2,000	$120 00
Barrows, A W, Trustee	547	1,000	60 00
Bowers, D	379	20	1 20
" "	404	500	30 00
Bogart, O H, Trustee	488	105	6 30
Carnes, W A	252	410	24 96
Francis, H L, Trustee	444	1,500	90 00
Nash, H W	200	104	6 24
Nordman, Leon	514	100	6 00
Rosekrans, H M	39	600	36 00
Stout, C S, Trustee	476	2,000	120 00
" "	477	953	57 18
Scarles, W A, Trustee	518	1,000	60 00
Stetson, A M, Trustee	520	5,000	300 00
Taylor, J N, Trustee	532	1,040	62 40

And in accordance with law, and an order of the Board of Directors, made on the 20th day of October, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on MONDAY, the 15th day of December, 1890, at the hour of one (1) o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

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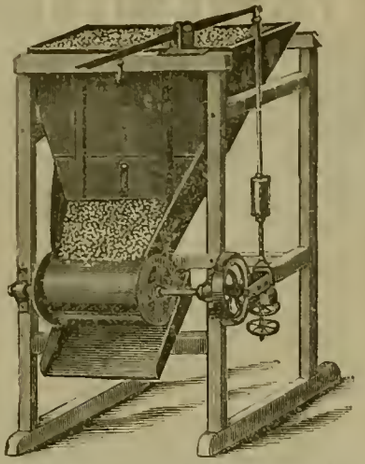

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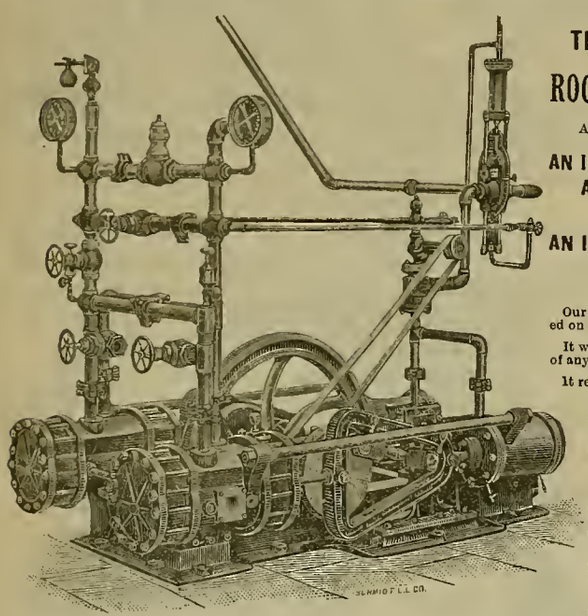

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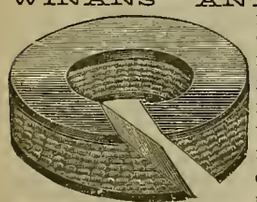

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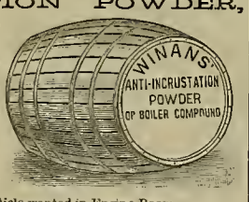

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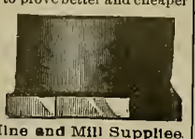

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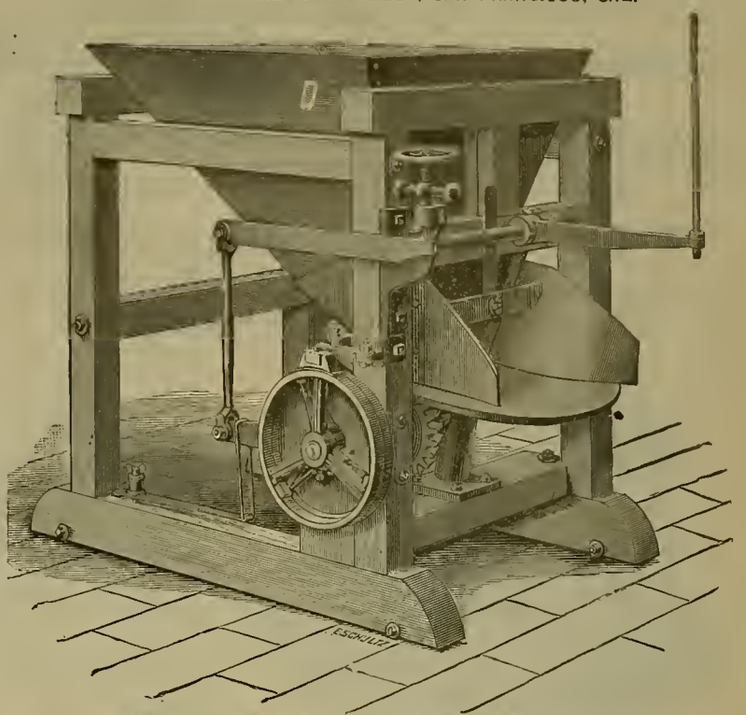

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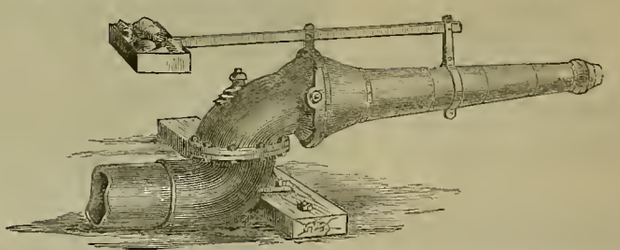

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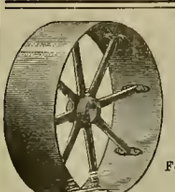

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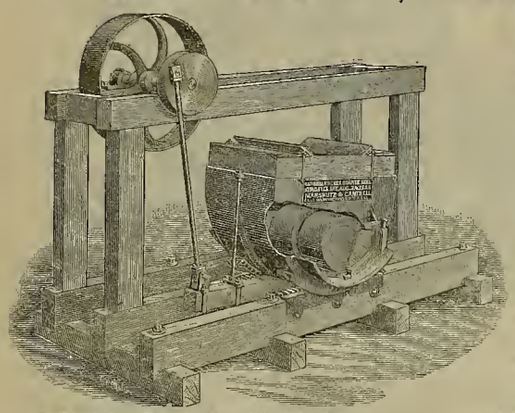

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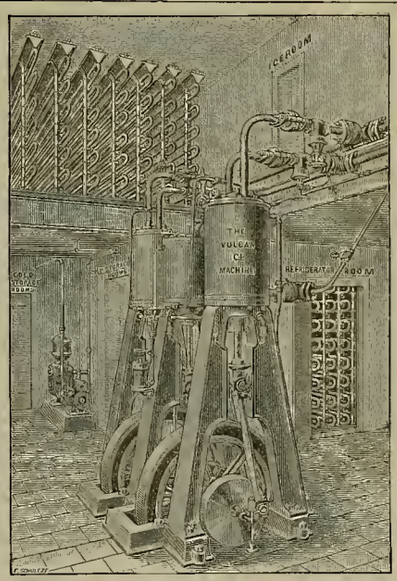

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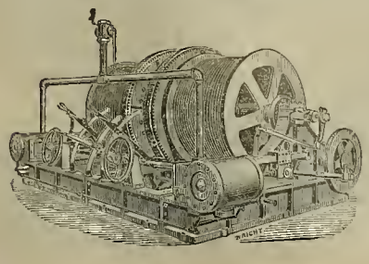

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☞This Resolvent IS NOT AN EXPERIMENT but a FACT, and it will do the work claimed for it at a LESS EXPENSE than any other boiler purge, AND IN NO MANNER INJURE THE IRON.

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We use the Pittsburgh "Boiler Scale Resolvent," and are well satisfied with the results obtained. We have tested nearly all Compounds presented to us, and this one **is the only good thing we have ever used.** Our feed-water is heated in Berryman Heaters, but owing to distance of heaters from boilers, we rarely exceed 150 degrees of heat in feed-water.

Our water is of the worst character, containing such bad impurities as **sulphate of lime, carbonate of lime, mud, and everything that is bad.** Very truly yours, WM. R. JONES, Gen. Supt.

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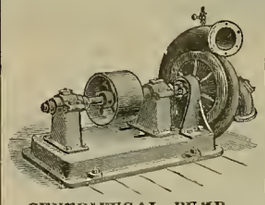

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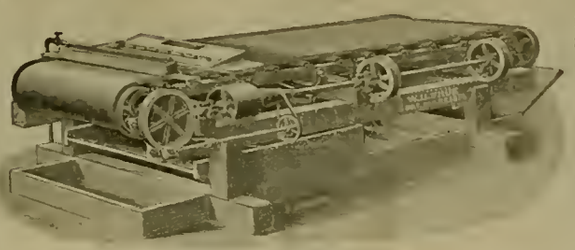
For Pamphlets, Testimonials and further information apply at office.



Protected by Patents December 22, 1874; September 2, 1879; April 27, 1880; March 22, 1881; February 20, 1883; September 18, 1883; July 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

The competitive trials which have been held between the "Triumph" Ore Concentrators, the "Frue" Vanners and other forms of concentrating devices, do not warrant the assertion that the "Frue" Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Triumphs;" for, when desired, they (the "Trimphe") can be mounted with a superior belt known as the "Blasdel" Riffled.

—o—

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
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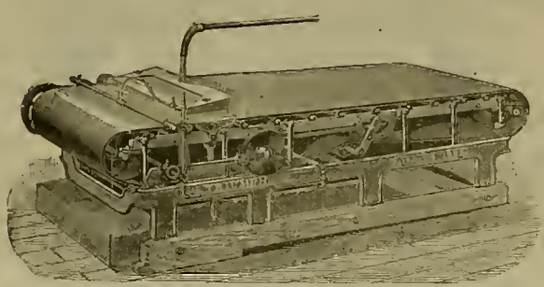

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(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical operation; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

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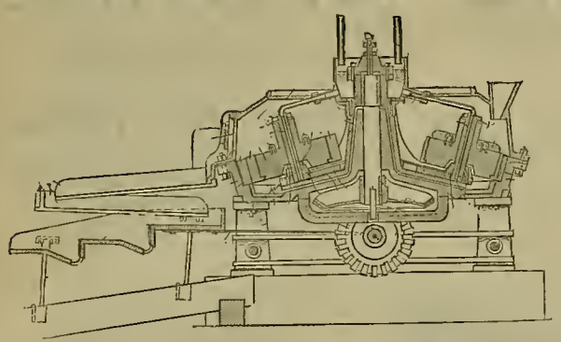

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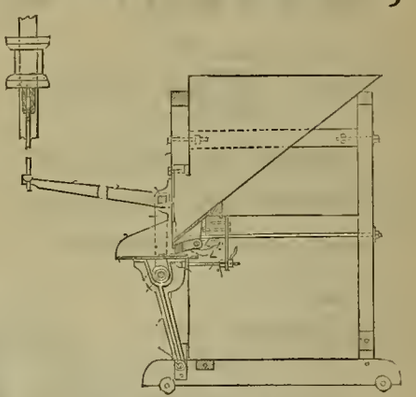

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Will feed Wet or Dry Ore, for either Stamp or Roller Mills.

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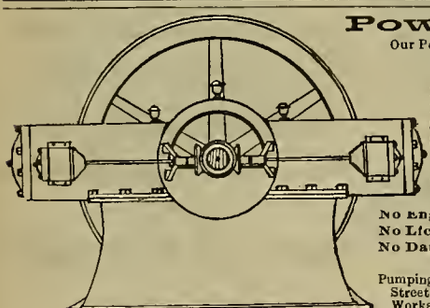

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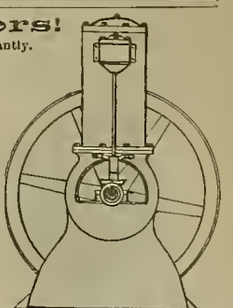

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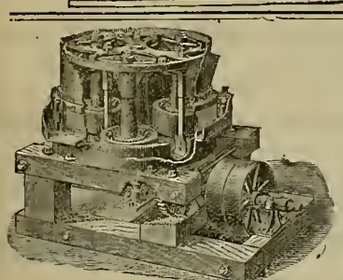

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COAL MINES OF THE WESTERN COAST.

A few copies of this work, the only one ever published treating of Pacific Coast Coal Mining, have been obtained, and are for sale at this office for $2.50 per copy. It was written by W. A. Goodyear, Mining and Civil Engineer, formerly of the California State Geological Survey.

JAMES M. HAVEN. THOMAS E. HAVEN, Notary Public.

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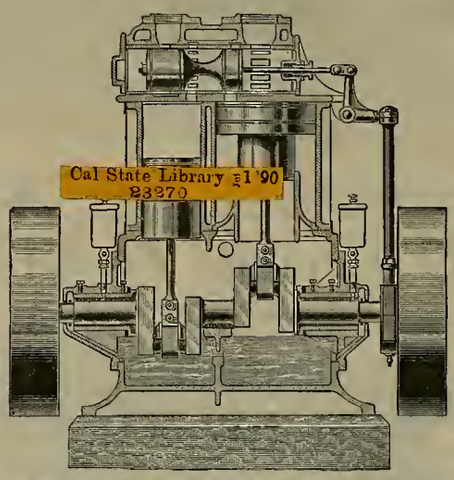
GREATEST CAPACITY OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps



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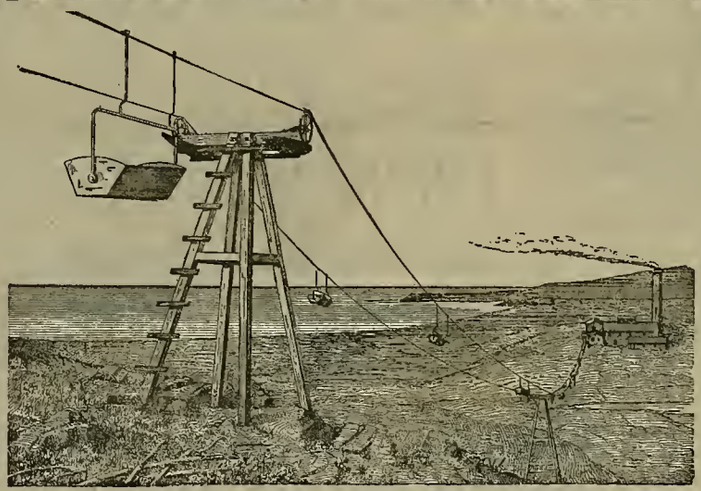

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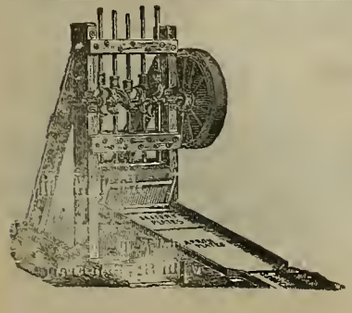

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VOL. LXI.—Number 23.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, DECEMBER 6, 1890.

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The Drawing Process for Sheet Metals.

The cuts herewith given are designed to illustrate the manner in which vessels of tin, iron or other metal are produced from disks of sheet metal by the simple process of drawing by pressure, instead of making them with seams, as in former times.

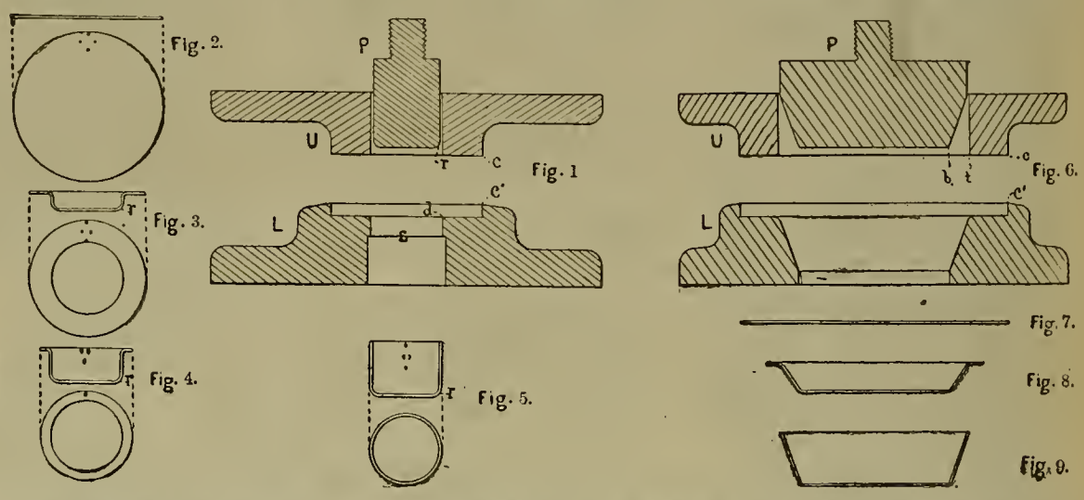
The operation consists in holding the disk so tightly between the two parallel flat annular surfaces of the dies that it cannot wrinkle while the punch which gives it its interior form is pushed down, through a hole in the upper die, into the recess in the lower die, which fits it with the proper amount of looseness to give space for the metal between. A set of these dies is shown in Fig. 1, in vertical section through their axis. In Fig. 2 is shown an axial section and a top view of the disk of metal, technically known as a "blank," before it is drawn. In Fig. 3 are shown the same views, respectively, at a later stage of the operation, when it has been drawn to about one-third of its final depth. At Fig. 4 it is shown at, say, two-thirds depth, and in Fig. 5 as completed.

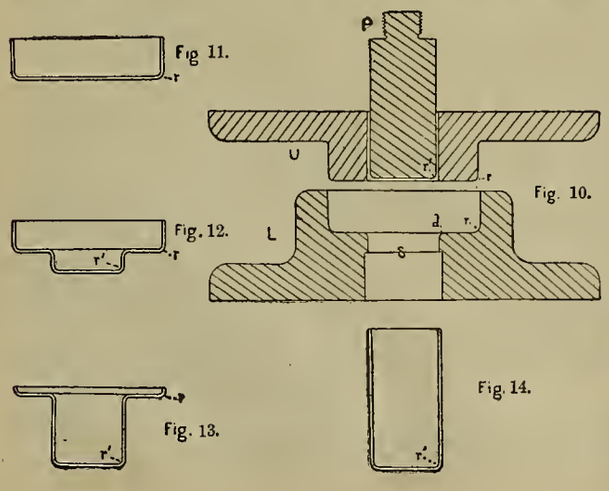
Four small dots will be noticed in Fig. 1, marked upon the blank, and forming the corners of a square, with its diagonal placed in a radial line. In the subsequent figures it will be noticed that two of these dots, upon either side of this imaginary radius, have gradually approached each other, while the other two dots, lying in the radial line, have receded, thus beautifully illustrating the respective directions in which the molecules of the metal have traveled in reaching their new locations.

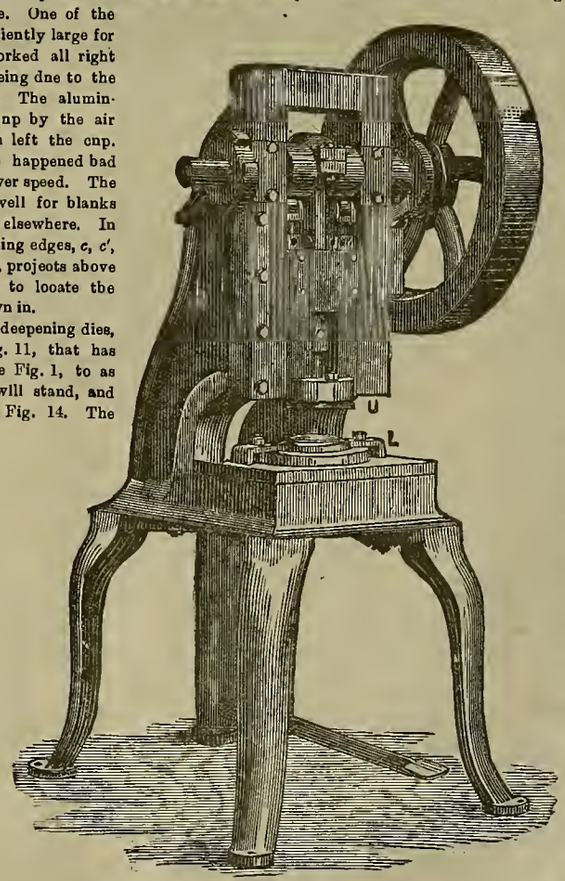
In Figs. 6, 7, 8 and 9 are shown a set of dies and the work in its several stages, of a form conical rather than cylindrical. The dies as shown in Figs. 1 and 6 are made so that they cut the disk from a large sheet of metal at the cutting edges c and c', as the upper die *U* descends to perform its mission of holding the blank from wrinkling between its lower flat surface and the corresponding flat surface of the lower die *L*. When *U* has descended until it is firmly in contact with the blank, it stops and remains rigidly in position until the punch *P* has descended and drawn the metal from between the two folding surfaces over the rounded corner *d* and down below *S* into its desired shape. The lower edge of the working part of the die *s* is called the "stripping edge," and is kept quite sharp so that the metal will not be pulled up again by the friction of the punch. Although it has just passed through the die, its elasticity expands it very slightly, so that this "stripping edge" is usually found sufficient to keep it down. That a blank not confined by a holding surface will wrinkle, is a fact easily proved by experiment.

In practice it is found necessary to put an ample vent-hole for air through the punch or else the cup is pulled up afterward by suction in spite of the stripping edge. One of the sample cups shown was insufficiently large for aluminum, although it had worked all right with tin plate, this difference being due to the stiffness of the latter material. The aluminum being softer, was pulled up by the air suction just before the punch left the cup. This, of course, would not have happened had the press been running at a slower speed. The dies shown will do equally well for blanks which have been previously cut elsewhere. In some cases, instead of the cutting edges, *c*, *c'*, a mere rim, with a round corner, projects above the surface, serving as a gauge to locate the blank centrally when it is thrown in.

In Fig. 10 is shown a pair of deepening dies, so called, which take a cup, Fig. 11, that has already been drawn in dies, like Fig. 1, to as great a depth as the metal will stand, and deepen it to the form shown in Fig. 14. The successive intermediate stages of the operation are shown in Figs. 12 and 13. These and subsequent similar processes are the ones used in cartridge-drawing, except that the metal is usually somewhat thicker than the space between the punch and the die, so that it is also subjected to stretching process similar to wire-drawing. This reducing in thickness is often called "broaching," but there is considerable confusion of terms used by various manufacturers.







GERMAN DRAWING-PRESS.

The presses used for all the dies just described are, of course, of special construction, being made with an "inner" and an "outer" ram. The latter carries the upper die and is arranged to stop for a time after a part of the stroke has been made, while the "inner" ram, carrying the punch, descends to the bottom of its stroke and rapidly returns, just as does the ram in an ordinary single-action press.

In Fig. 15 is shown a small drawing press for work of this kind, which explains itself. It is a picture of a German press and shows fairly well the principle involved. There are several kinds made in America, of better design, of which it might seem invidious to show one without the others.

A NEW ATTRACTION AT THE STATE MINING BUREAU.—Many visitors have during the past week been drawn to this institution to get a view of an exceedingly well-preserved Egyptian mummy now on exhibition there. This interesting relic from the land of the Pharaohs was loaned to the Bureau by John P. Young, Esq., to whom it was presented by the Hon. Jeremiah Lynch. The latter gentleman came in possession of it during his late sojourn in Egypt, having obtained it fresh from the tomb where it had rested undisturbed for more than 2000 years. As appears from the inscription on the outer casing, it is the body of a priestess in the Temple of Ammon-Ra, at Lycopolis, who died during the reign of the fourth Ptolemy, more than 200 years before Christ. Not only is the body of the priestess and the wooden case containing it well preserved, but colors in which the hieroglyphics and other emblems have been painted on the outside seem as bright and fresh as when first laid on, all of which may be accepted as evidence of the skill to which the Egyptians had attained in the art of embalming and the preservative effects of their climate. The public are under obligations to Mr. Young for placing these remains where they can be conveniently seen by all.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

French Gulch, Shasta County.

The Gladetone Mine and Mill.

EDITORS PRESS:—Having recently visited and mill hy the very efficient superintendent, the property of the Gladstone Co., located north of French Gulch, I was shown through the mine Capt. Clark, who has had much experience as a mining man hoth in thia country and in Sonora, Mexico.

This company, which has recently purchased here 11 mining claims, the Gladstone being one of the numher, has since proceeded to eqnip the same with a first-class plant, consiating of a 20-stamp mill with ahops, hoarding-honees, etc., especial cara having been taken to provide for the health, convenience and comfort of the workmen. The mill, which carries 20 stamps and is very complete in all its appointments, is now ahont finished and ready to start up.

It was at first intended that it ahould carry hnt ten stampa, hnt the improvement shown in the mine as developments progressed, determined the company to pnt in 20 stampa at the atart. It is to he rnn hy water-power, the water heing hrought in thrnugh a flome several thonaand feet in length, and delivered under a pressnre of 282 feet.

The mill, mine, and all the huildings connected therewith are to he lighted with electricity. The dynamo to he placed ln the mill will also he run hy water-power. The mine at present is heing worked throngh the Gladstone and Helena tunnels. The Gladstone, whioh is the only tnnnel of any great length yet run, is ahout 1000 feet in length. The Helena tnnnel, ahout 200 feet farther up the monntain, is in 200 feet, showing at the breast a hody of ore 14 feet wide and averaging $20 per ton. The Ohio tunnel, located on a lower level, is to he driven into the mountain aome 800 feet, where it will tap the ledge at a depth of nearly 500 feet. This will he the main working level. While this mine has heen called a low-grade one, some of the ore fonnd here is ao rich that it will he sacked and taken to the mill. Thare are at present ahout 100 men employed in and ahout the mine. The lumher nsed is hanled from Redding, and it will take several hnndred thonsand feet to finish the work.

It would he a good thing for investors if we had ln the conntry a few more mines like the Gladstone, and it would he a good thing for the workmen if we had a few more mining snperintendents like Capt. Clark to look after their comfort. B. F. B.

French Gulch, Shasta Co., Cal., Nov ,1890.

More About Tempering Drills.

EDITORS PRESS:—I do not know that any information I may impart as a practical hlacksmith will he of henefit to Mr. S. H. Bryant of Tombstone, Arizona; hnt this much I will say: Having had years of experienoe, I helieve that practioal resnlts are of more value to the practical mine-worker than any scientific knowledge "as to what may canse oracka in steel drills." I have worked dnring my lifetime thirty years at my profession, and at different periods have worked all hrands of steel used for mining pnrposes. When a hlacksmith sharpens three hundred drills and sometimes more, in a day, and the necessary amonnt of picks, gads, etc., if throngh hurry or carelessnees of his helper a drill is hurnt, the only way is to cut off the hnrnt portion.

My method of workiug cast steel drills ie as follows: I nse hot and cold water. Drills mnst he heated to an even heat to sharpen. I chill from the hammer, and as ls the case often, the drill is heated two and sometimes three inches ahove the point. I immerse my drill in the cold water, eo aa to exclnde the atmosphere from any portion that ls heated, for eight or niue aeconds, withdraw immediately, and drop lt into the hot water (the hotter the hetter) and let it cool there. My reason for so doing is thia: I do not helieve in anything hut a chill (hardened right out) for a rock drill; hy immersing the drill so as to exclnde the air, the shank portion is chllled only skin deep; hy putting it in the hot water the point retains its chlli as desired, while the shank from the heat in it comes down to its natnral order. Practical mining hlacksmlths will know my meaning. I venture to assert lf snch a method he adopted, few drills will break ahove the hit and cracks will he hnt seldom seen. I have sharpened Firth & Son's steel forty times without cracks of any kind, and our oommon American hrande twenty times and sometimes more.

Believe me to he a reader of the PRESS and a lover of the information it contains.

JNO. DUNCAN SMITH.

Navajo Mine, Tuscarora, Nov. 17, 1890.

PUBLIC FRENCH OPINION ON THE LENOTH OF A WORKING DAY.—Among the 19,455 anewers to the list of qnestions connernlng the regolation of the working hours and of work generally which have so far heen received hy the French Commission, 4442 are against any and all regolation, 5012 are in favor of a working day of eight hours, and 9270 advocate as the number of honrs to constitute a day's work 9, 10, 11 or 12; 731 answers are too vague to deserve notice.

As Others See Us.

Mr. E. Dickinson, Sheffield, England, who participated in the recent international meeting of engineers, stated, when interviewed on his return to England regarding his impressions from his journey, according to the *Iron and Coal Trade Review*, that the Americans consider that they are in every way in advance of the mother conntry, and, in fact, of all the countries in the world. "Their buildings and institntions are higger and hetter than anywhere else; their works and manufactories are on a very large scale, and the ontpnt, owing to improved organization, is considerahly more than would he seonred hy the same nnmher of men and the same amount of plant in England."

As an instance, the worke of Disston & Sons, at Tacony, where saws and files are manufactnred, turn ont an ontpnt in saws equal to the total outpnt in Sheffield. Their prodnots are all machine made.

Generally, machinery is more extensively nsed than in England. At Diaston's works, Mr. Dickineon was atrnck with the machines for cutting and at the same time gradnating the teeth of hand-saws. They were fed hy lads, and the hlades paesed through as quickly as it was possihle to handle them. The mahines cnt 1500 teeth per minnte. The same firm alao has a mnch more expeditions and improved method of "goffieg" and tempering than Sheffield firms have. The furnaces used for this pnrpose are heated hy gas and have a revolving center. He was very mnch interested in the manufactnre, at Disston's, of circular saws with renewahle and interchangeahle teeth, an invention he termed "caplta1." In the warehonse mentioned, he observed packages of saws addressed to England, and also saw some hand-saws there 40 feet ln length by 14 inohes wide.

"The American manufacturers go more in for quantlty and rapidlty of output than quality; hnt they do not care to pnt work and high finish on parts of machinery that are not seen."

"In general tools they have not anything like the same nnmber of patterns, consequently in slack times they can make immense stocks, and know exactly how long lt will take to dispose of them."

The American prodnots he did not find anperlor to the English, and in many cases decidedly inferior. "But the Americans are mnch more inventive than other nations, and their patents mnch more valuahle."

Mr. George Siddell, Sheffield, was greatly impressed by the ahundance of our resonroes, the rapidity of our indnstrial development, the enterprising spirit, industry and application of our people. Greatness, he thinks, is eqnally characteristic of the manufactnres here and of the physical resources of the continent. Everything he found to he on an extensive scale, except gnns and ships; and the fact that the Government has hought up the nickel mines he interpreted as siguificant of its intention of making armor-plates on a very different scale from anything as yet attempted. The American mannfactnrers never stint expenditure as to plant and machinery; and labor-saving appliances in the iron and steel works, and especially in the rail and plate mills, cnt manual labor down to a mere cipher. Therefore he helieved that hnt for the tariff the American mannfacturers wonld he ahle to compete with the English in any market.

As to the ontput of the American works, he admitted its greatnese, hut thought that in England the Consett Iron Company turns out ahout fonr times as mnch as the largest American worke. Whereas, Carnegie's output is ahont 4000 tons a month, the Consett Iron Company produces ahont the same quantity every week. Carnegie's place is magnificent. The arrangement of the melting furnaces, hoth there and at some of the otoer places, is splendid. There is nothing in England that comes np to it. Some of the melting furnaces have a capacity of 35 tons, and there are hardly any in England greater than 30 tons. They have many circular furnaces, too, which are not seen in England, hnt he did not know that there is any great advantage in that mode of construction. At Chicago they roll direct from the ingot, without reheating, which ls also done in some English works, hut Carnegie's method of rolling from the bloom he considers hy far the safer plan.

Asked as to the comparative capahilities of English and American worke, Mr. Siddell admitted the enperiority of the American rail-mills, hut as to large forgings they do nothiog heyond ten tons, "whereas the English worke can rnn np to any weight that there is a call for." He qualified, however, these statements hy remarking that he had not inepected the Bethlehem Works, where the Government orders are executed for gnn forgings and the like. "There is a splendid opportunity," Mr. Siddell added, "for energetio Englishmen to go ont there in the heavy trade. They might make a fortnne in a very short time, hecanse there is no heavy work done there yet. They are jnst oommenciog with the gnns, and any one well np in gnn forging could command his own price."

Both gentlemen were fnli of admiration for the American workingmen as steadier, more intelligent and quicker than the English operatives. They work harder and longer honrs. Mr. Dickinson's helief that the Amerioan workman who receivee £3 a week is not hotter off than the Englishman who only gets £2, owing to the smaller purchasing power of money in America, is hardly compatihle with his nttterance that the American workingmen "strnck him as heing well dressed and having very comfortahle homes; and a higher social tone prevails among the artisans there than in many of onr indnstrial centers."

That America is far ahead of Europe in the numher and variety and efficiency of electrical applianoes, was acknowledged as an undiepnted fact.

Mr. Dickinson ventnred the opinion that English firms transferred to Amerlcan soil might he highly snccessful if they had enough enterprise and energy. Another statement of Mr. Dickinson to the effect that "Americans admit that in cutlery they cannot approach the English for quality; that the well-to-do Americans lnvariably have Englieh cutlery for their own nse; and that you cannot pay an American a greater compliment than to give him a really good Sheffield knife," needs no comment to he appreciated.—*Engineering and Mining Journal.*

Gold Mining in South Africa.

A report issned hy the Witwatersrand Chamher of Mines gives a fair idea of the actual condition of affairs exiating in that portion of Sonth Africa, at least it gives a fair idea to those who have watched the hoom, growth, development, decline, revival and final adjostment of affairs npon a hnsiness hasis of profit and loss. The history of mining regions is hnt a repetition of one story.

The report states that the value of the groes production last year was, in ronnd nnmhers, $6,950,000. The mining industry of Johannesbnrg is the only value-prodncing industry there, so it must have paid for all expenditnres there which the ontside world did not pay for.

The expenditures are placed at $9,000,000 paid for freight on snpplies, while the valne of the supplies is not given. Taxation and royalties on mines amounted to $4,410,975, and wages to $1,160,000. How much of the wages, royalties and taxes entered into the freight or transportation acconnt cannot he told. Possihly all of it did. Leaving ont these items, as well as the cost price of all snpplies, and considering only the freights paid, we find that $6,950,000 of gold cost $9,800,000. The condition of affairs there is much like what it was in the Rocky Mountain region when all supplies were hanled from the Missouri river, and when the freight rates were from 5 to 25 cents a ponnd and the freights alone exceeded threefold the value of all the gold prodnced in the mountains. There are, too, other features common to Africa now and this region when it waa very new, 25 years ago. Dance-honses, hurdy-gnrdys, gambling, and all their accompanying lawlessnees characteristic of new mining regions, have heen holding high carnival at Witwatersrand, as they once did here.

But what can he thought of mining in a region where, out of a total production of $6,050,000, the sum of $4,410,975, or over 60 cents on a dollar, mnst he paid to the Government as taxes and royalties?

Death Rate in Different Industries in England.

According to an Eoglish exchange, the annual death rate per 1000 employed is as follows:

	Age 25 to 45 yrs.	Age 45 to 65 y'rs.
Average for the whole country	10.16	25.27
Minimum	4.64	16.93
Maximum	22 63	55.30
Coal miners	7.63	25.11
Iron ore miners	8.05	21.35
Tin miners (Cornwall)	14.77	52.69
Cutlery makers	11.70	34.42
Boiler-makers	9.27	26.65
In iron and steel works	8.36	22.35
Average for metal-workers	8.80	25.03

It appears, therefore, that coal mining, instead of heing an "extra hazardons" occnpation, is in reality one of the safest.

RESPONSIBILITY OF EMPLOYER FOR SAFE APPLIANCES.—A mining company which employs a superintendent to hire and discharge the men and fnrnish them with snpplies is responsihle for his negligence, and notice to him is notice to the company. Where a company nndertakes to supply its miners with fuee, it is charged with the dnty of fnrnishing good fnse, and where notice is given to the enperintendent that fnse supplied to a miner ie had, and he tells him to do the hest he can with what he has nntil more can be seoured, the company ls responsihle in damages for injnries sustained hy the miner if he ie injured while using the defective fuse with the degree of care which its condition wonld impose upon a prudent man.

THE FIRST SIAMESE RAILWAY.—In our Indian mail we find that a German company has got the contract for the first Siamese railway. The line will he 165 miles long from Bangkok to Korah. German rails and machinery will he nsed, and German engineers will he mostly appointed. Mr. Bathze, in charge of the work, promises to lay the line down for one million sterling.

A BERLIN statistician reports that the nnmher of suicides in the varions countries of Europe, including England, was 85 per cent greater hetween 1880 and 1890 than dnring the preceding decade.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XXII.

[Written for the PRESS by JAMES H. CROSSMAN.]

Mineral Belts.

It is a well-nnderstood and acknowledged fact that metalliferous veins in all important mineral-hearing conntries occnr in belts or zones of considerahle longitndinal extent and of variahle widths. These helts are nsually fonnd in triplets, and as a rnle lie parallel with each other. Situated within their exterior honndaries and adjoining one of the contacts, a so-callad mother vein—it being of mammoth proportions—occurs. The gangue is either silicoons or calcareous or a oombination of hoth minerals—lt being invariahly metalliferons. From this main lode radiate hranches, spure, feeders and stringers that draw their metalliferous contents from the helt proper. To nse a simile, the helt is the metalliferons water-shed that supplies the tributaries which flow into the main artery. The formation compares to a tree—the mother lode being the trnnk and the spnra and feeders the hranches.

Notahle instances of this law of nature are fonnd in the Veta Madre of Mexico with its parallel metalliferons helts—the so called mother lode of California with its three or more parallel helts comprising the copper-hearing zone on the west. The first east consists of the helt that forme the metalliferous domain of West Point, in Calaveras county, traceahle northerly and southerly for a long distance. The next east and paraliel we find the helt in which the Sierra Buttes, Plumaa-Eureka and other prominent mines are situated. The Comstock of Nevada is traceahle for a long distance with the two or more parallel mineral helts or zones.

San Bernardino oonnty is no exception to this rnle. She haa within her houndary lines at least three important mineral helts whioh we will describe later. It is this fact that enahles the mining prospector to snccessfully prosecute his work of discovery. Regardless of formation or debris-oovered valleys, his compass his gnide, he takes his hearings and starts for an objective point, and he seldom misses finding, in the first monntain peak that rises ahove the level of tha plains, metallic float, either in the ravine or on the sidehills of the range. He traces the float to its sonrce. If the lode does not crop, he sinks his shaft and finds it.

In Artiole 21 of this series it is stated that the next numher wonld contain a description of Calico and its mines; hut after a recent and more careful examination I have decided that the complex nature of the mineral-hearing zone in which the prominent mines of that locality occur, requires a more thorough investigation and careful study before entering npon its description. The vein ocorrrence, however, in the violnity of Calico has heen governed hy the same general laws—Calico heing no exception to the rnle; hnt as volcanic action and its reanltant effects have been more violent and decided at this point than at any other in San Bernardino connty, the phenomena reqnire an especially carefnl examination. I will therefore for the present continne my general description of the helt in which the metolliferons veins of Calico monntain occur.

The helt proper has a longitndinal extent of at least 140 miles. Its strike is north 65 east and sonth 65 west. It is of variahle widtb, expanding and contracting. At its narroweet point it is one mile wide and at its greatest expansion eight miles wide—disappearing where covered hy soil and debris of the valley lands, hut invariahly appearing in all elevated peake and monntain ranges on its line of strike. Its mineralogical featnres are strongly marked and easily recognized from the surrounding strata hy the metamorphio condition of lts rocky structnre, as well as hy discoloration caused by metallic oxides that stain the snrface of the mineral-hearing veins which occnr on the helt. The Iron Hat, so well known to the mining prospector, is a snre indication that it is only the cap of a metalliferous vein containing either lead or silver. A hlne-green or red stain indicates copper—its carhonates and oxides appearing on the snrface.

During the periods of voloanic activity that at no remote period, geologically speaking, convnlsed the whole western portion of the American continent from pole to pole, powerful gaees and thermal waters, snrcharged with hoth mineral and metallic substances, have fonnd vent at the earth's crust, throngh either previonsly or contemporaneonsly formed fissures—their sonroea reating in deep-seated centers. These volatile gases and squeous products, on meeting wlth reagents in their upward passage, deposited hy precipitation their hurden—the latter silica and lime in the form of a paste which rapidly orystallized, filling the fissnre vents with qnartz and spar of their several varieties of silicoons and calcareous compounds. Thie formed the gangne of the vein, which in turn was impregnated with metallic compounds hy the same common carriers, gas and steam, augmented at a later date hy electrioal aotion concentrating and depositing the precious and haser metals from the enrrounding rooks hoth in and on the vein plate of Natnre's electric hattery. This process is in oonstant and never-oeasing operation.

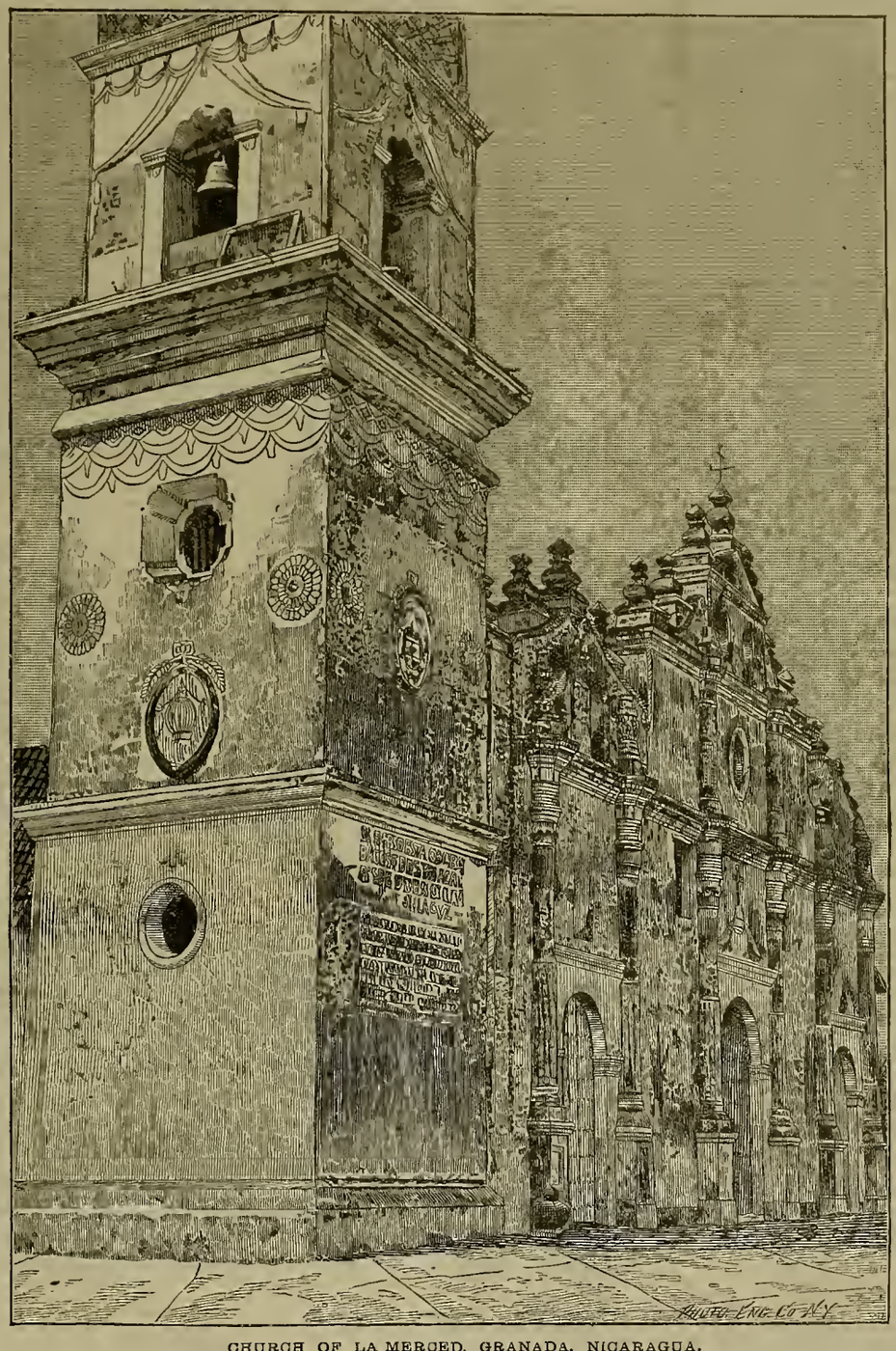
In onr description of this important mineral helt we will commence at its southwesterly extremity, where the low hills and monntain

ranges emerge from the Mojave desert. At this point its mineral character is first noticed. It shows a width of six miles, by a longitudinal extent of 12 miles—in several places covered by the debris of the valley lands, but plainly marked and distinguishable at all elevated points. It is here that we find the several mining camps of West, Central, North and Galena—each situated on elevated points above the plains (for particulars, see Article 17 of this series); thence northwesterly, following the course of the belt over a debris-covered plain for a distance of 24 miles, we enter the boundaries of the Grapevine Mining District, which contains the southwesterly extremity of the Calico mountain range. At this point, we having entered the confines of the Plutonic realms, evidences of volcanic activity are seen on every side. To the unpracticed eye of the casual observer, the rocky structure has been plicated, crumpled, faulted and thrown into every conceivable shape and to all appearance into inextricable confusion; but to the practiced eye of the observer and geological student who has graduated in the field, order from chaos can be restored. Both the exterior walls of the belt are in place and discernible. The underlying or footwall still carries the mother lode; the northerly wall is intact. The intervening space, though much disturbed and with long lines of volcanic debris and ash, shows marked and well-defined veins of spar and quartz rich in the precious metals, which will be particularly described under their appropriate head. This portion of the belt from the Central to the Emma, Waterman and Calico mines is traceable and continuous on its line of strike for a distance of more than 18 miles, with the exception of about 3½ miles of intervening debris-filled valley lands (see Article 5); thence on our course for 12 miles over a desert country, we reach the southwesterly flanks of the Alvord range (for description see Article 19). This mountain has a longitudinal extent of 15 miles. Thence, crossing a desert of 20 miles, we reach the range that contains the Solo Mining District, northerly from Soda lake (see Article 19 for description of this district and its mines). At this point the belt has a width of six and a length of three miles; thence, over a desert country for 24 miles, a low range appears above the plain which contains a group of silver and lead bearing mines known as the Bell discovery. The ores are of low grade but abundant, with no development of importance. The formation is similar in every respect to the Calico range and continuous for a distance of three miles, thence crossing a desert to the westerly flank of Clark Mountain and Mining District, of which the town of Ivanpah forms the distributing point for the surrounding country. This range is nine miles long. Its formation is largely calcareous, containing powerful dykes of porphyry and trap. The veins form in groups each independent of the other, and as a whole are comprised within the boundary line of the

Clark Mining District,

Which covers an area of about 600 square miles. This district is situated in the northeastern portion of San Bernardino county, the oldest organized mining district in the county, and in which the first silver bullion was produced. A frontiersman and well-known prospector by the name of Johnny Moss was the discoverer in 1868, through the assistance of a Piute chief, who brought him a piece of metallic copper which he had found in the vicinity. Johnny investigated and discovered its source, took samples, went to San Francisco and organized a company to develop the mine. The writer accompanied the outfit as mining expert for the company to determine its value. The party outfitted from Visalia. A Mr. Clark, one of the company, accompanied the expedition. At that time the Indian tribes of the desert were hostile, killing travelers and committing depredations in every direction; but Johnny was equal to the emergency. He formed a treaty of peace with the Piute tribe and was permitted to travel over their territory unmolested, drink water from their springs, kill their rabbits and mountain sheep, and work their mines. This treaty was kept in good faith by these nomads of the desert until news was brought by one of Moss's Indians that three German prospectors had been killed in the Arawatz mountains. Johnny, who had been previously elected as an honorary chief of the tribe, sent out his runners and built signal fires on prominent peaks, calling the Indians together for a powwow. The tribe assembled. A "big eat" was first in order; after that the traditional pipe of peace was smoked, and Johnny addressed them in the language of their tribe, asking them why they had broken their pledges by killing the prospectors. A consultation was held by the chief and medicine-man of the tribe, and they denied the allegation, claiming that Dutchmen were not white men and that they had not broken their treaty. After that, the Teutonic race was included in the treaty and peace reigned in the desert. On Moss's adoption by the tribe he was given the name of Narraguinip (never die). He died all the same, but the Indians still claim that he has crossed the big waters on a visit and will soon return.

(To be Continued.)



CHURCH OF LA MERCED, GRANADA, NICARAGUA.

An Old Church at Granada.

We illustrate on this page a very interesting structure of great age, the cathedral at Granada, a city of Nicaragua, a country which will come into growing importance in the world's eye as the Nicaragua inter-oceanic canal progresses nearer to realization.

Granada is a city lying on the western shore of Lake Nicaragua. The towns near the lake, of which Granada and Rivas are the chief, might under happier auspices have become great centers of population; but years of anarchy and internecine strife, together with the jealousy of rival cities—Leon and Managua for example—have produced more of ruin than time itself. Many a follower of Walker could tell stirring tales illustrated by the battered walls, wrecked churches and "places stormed at with shot and shell" in Granada and Rivas. There has always been a certain jealousy between the Nicaraguan cities as to the right to be considered the capital of the State. Even to-day it is not a safe issue for a stranger to raise. In the total population of 400,000 the ancient and aristocratic city of Leon comes first with 30,000 inhabitants. Massaya comes next with 14,000, of whom, however, a large number are Indians. Then there is Granada with 12,000, and Managua, the generally reputed capital, with 10,000. Rivas, the ancient capital, has dwindled down to fifth place with 8000, but as the proposed canal will pass quite close to it, the prospects for its restoration to supremacy are exceedingly good.

Nicaragua is essentially a land of antiquities. The splendid churches and cathedrals built by the Spaniards have architectural charms and ruined glories of their own. The great cathedral of San Pedro of Leon is probably the finest religious edifice south of the City of Mexico. It was finished in 1743, at a cost of $5,000,000, occupying 37 years in construction. It is of cut stone and is one firm mass of masonry, covers an entire square, and its front extends across one side of the Grand Plaza. Like similar buildings whose ruined arches and walls may be seen in Antigua de Guatemala, this church has walls at least 15 feet in thickness, and has the solidity of a rock. Numerous earthquakes have produced no impression, and the storms of a century and a half have in no way injured its fine quality of stone. In numerous disputes between Leon and Granada, the church had often been converted into a fortress, and sustained a few bombardments from besieging forces. Thirty pieces of artillery are said to have been planted on its roof at one time and on its eastern side there are many indentations made by shot. This cathedral was once possessed of great wealth, the chancel was surrounded with a railing of solid silver, while all the altar ornaments were of gold. With the exception of the cup and plate used at mass, the church has no ornaments of precious metals now. Much was shipped to Spain, and what remained did not escape the rapacity of the soldiers, who have many times advanced and retreated through Leon.

The church shown in the engraving on this page is quite different in some respects from that at Leon to which reference has been made. It is the church of La Merced. It is ancient, massive, and in a good state of preservation considering the vicissitudes through which it has passed.

BLACK HAWK MINING COMPANY.—This company, composed of English capitalists, operating in the San Bernardino mountains, 40 miles east of Victor, has suspended operations, it is said, on account of low-grade rock. This company has expended a large sum of money in a hydraulic placer-mining scheme at Holcomb Valley. It seemed to possess abundance of means and no little amount of enterprise. In addition to the above work, it has bonded numerous prospects and purchased a number of tracts of land. At present it is engaged in developing its hydraulic mines on Lynx creek, near Prescott, A. T. At this point it is building an expensive flume ditch and dam. It is proposed to utilize the water after it has passed beyond the mining works in irrigating a large tract of land in Lonesome valley, recently acquired by Mr. Peddley, the superintendent of the company.

THE GERMAN GOVERNMENT AND THE MINERS. It is officially announced that all, or nearly all, the demands which were recently submitted to the German Government by the miners' delegates have been conceded. The principal points are that shifts last eight hours only, that all the miners who were dismissed after the recent strikes shall be reinstated, and that provision shall be made in the Labor Amendment bill, now before the Reichstag, for the creation of arbitration courts. The mining officials are also to come under the jurisdiction of the court of discipline, and they are to be punished for ill-treating miners. "Farming" certain jobs is also to be abolished.

THE copper mines at Vershire, in the eastern part of Vermont, have been pumped dry and large gangs of miners are working in them night and day. To light the mines and the smelter, an electric-light plant has been put in. The houses have been repaired and painted, and are now filled with workingmen and their families. The opening of the mines has made a good market for the farmers, and the abandoned farms will be wanted. The mines formerly employed 300 men.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

FROM SUTTER CREEK.—*Ledger*, Nov. 29: At the North Star, about 60 feet from the shaft east, the ground began to change softer and a little water was discovered, and soon after quartz was struck. They have now a stratum of ground with stringers of quartz, which will altogether aggregate in the neighborhood of a foot, and under the assay process it has yielded $700 per ton. It may be a pocket, however, as it was at the 600-foot level, which lasted but a very short time. Another week and they can form a better opinion as to its permanency. Cheering news has also come in from the Rose mine. In drifting east they have encountered a body of ore apparently of considerable extent, which prospects well. They have not cut through it yet, and cannot tell what the thickness of the ledge is. Almost everything about the Wildman mine is finished and works like a charm. A painter is now at work putting the finishing touches on, which will take about two weeks. Taking everything into consideration, this is one of the best equipped mines in the county. The Lincoln is running along steadily with her 20 stamps. The ore being crushed is said to be of very good quality, and there is enough in sight to run them for some time to come. Exploring about the Sutter mine is going on satisfactorily and prospects are encouraging.

PLYMOUTH.—In the Plymouth Con. mine the drift running south from No. 2 crosscut has a small vein of rich rock. It is only ten inches wide. If this would only widen out to five or six feet we would have something grand. They are pushing it as fast as possible.

ON THE MOTHER LODE.—The Keystone has lately reduced its force of miners. Twelve were discharged last week, reducing the underground employes to about 50. At the Casco or Hardenburg claim at Middle they have at last got to the bottom of the shaft after encountering unusual difficulties. They are now cleaning out the drifts, which is also a tedious and disagreeable undertaking. Arrangements are being made to crush 1000 tons of quartz from the Clinton Peak claim at the McKenzie mill. The rock will be taken from the large ledge near the mouth of the tunnel. The Amador gold mine will, according to recent advices from London, be soon in a position to start up work again. The principal American owner is expected here shortly to make the necessary arrangements for his associates to put up their pro rata of the sum required to place the company on a solid financial basis. The money due from the London investors has all been raised and can be paid at any moment when the balance is forthcoming. Mr. Minear, who formerly managed the mine, is now running another concern down in the Julian district, near the Waterman property.

Calaveras.

PROGRESS MADE. — *Chronicle*, Nov. 29: F. J. Horswill has commenced work opening up the Pellaton gravel mine near the Junction. We understand that Mr. Tuttle of the Tuttle mine in Chili gulch is negotiating for a 10-stamp mill.

AT ANGELS' CAMP.—*Mountain Echo*, Nov. 27: The future of Angels never looked more promising. It is now a well-established fact that the mines here are situated on what is known as the mother lode, and as to their permanency there is not a doubt. All the mines now in operation in and near this town are running full-handed and yielding good returns. There is no doubting the fact, Angels mining district is the best mining section in the State to-day, and a few years hence the mines of this town alone will rival if not surpass any in richness ever worked on the Pacific Coast.

El Dorado.

SHOWS UP WELL.—Georgetown *Gazette*, Nov. 27: Machinery and material continue to arrive for the Van mine. Supt. P. P. Tischer is maturing the work as fast as possible, and with a continuance of this favorable weather will get the mill and hoisting works ready for business before another week. C. S. Hersey is the millwright. A few hundred tons of ore is already on the dump, and it shows up exceedingly well by pan tests. We rather think this mine will cause some of the Silurians to crawl into their holes and double up before spring.

THE CALIFORNIA WATER CO. has had a force at work during the past two weeks building a dam on Rock canyon, below Noble's mill, for the purpose of raising the water to obtain sufficient grade for their ditch.

Fresno.

COAL.—*Republican*, Nov. 27: The San Joaquin Valley Coal Mining Co. are pushing developments on their coal deposit in the Coast Range. These deposits are at the edge of the foothills, 3½ miles from Coalingo, a station on the branch road to Gosben. The company has built a branch line from Coalingo to the mines, which they operate, having an engine of their own. They have 40 men at work and the output is about 50 tons a day. The coal is a bituminous lignite. While it is not a first-class domestic coal it gives excellent satisfaction for steam purposes. A test made at Los Angeles upon the invitation of the Los Angeles Cable Car Co., proved it superior steam coal, heating the Gallup coal of New Mexico.

Inyo.

OFF FOR DEATH VALLEY.—*Independent*, Nov. 27: John Alexander left town yesterday for Death Valley, his only company being five donkeys packed with a camping outfit. He intends prospecting in the valley and surrounding mountains for several weeks. Mr. Alexander knows the country well and feels quite safe in going there alone.

LEE DISTRICT.—Last Tuesday George Lewis and White Smith left town for Lee Mining district. There is a large quantity of low-grade ore in the district; it carries about 45 per cent lead and 15 to 20 ounces silver per ton. At the present price of lead it is believed that the ore can be delivered at San Francisco and leave a good profit to the miners. It is estimated to be worth between $60 and $70 per ton at the mine. The ledges are big, the ore easily mined, and if it will pay at all a large number of men can be employed. It is to determine this point that the trip is made to the district.

WILD ROSE DISTRICT.—*Independent*, Nov. 28: Wild Rose district is one of the most promising but least known mining districts in the county. The main hindrance to better prospecting there is the want of a road to reach it. Gunn and Fitzgerald contemplate building a road that will give access to the district by wagon teams and be 21 miles shorter than any road now existing between there and Darwin. It is known that there are many fine-looking ledges of ore in the district and all the indications for valuable mines. The opening of the proposed road would surely lead to a great deal of prospecting in the district.

FROM THE MARBLE QUARRY.—Two carloads of marble were sent north yesterday morning. The stone is for the Mills building, San Francisco. Very handsome slabs of marble are being taken out now for the building, some of them being 18 feet in length and of proportionate width. These will be cut and polished at the mill on Truckee river.

Los Angeles.

MINES IN SAN GABRIEL CANYON.—Pomona *Times-Courier*, Nov. 29: Cullen & Miller of Glendora are pushing the work on their silver mine in the San Gabriel canyon. The First National Bank of Los Angeles has on exhibition a brick of $1300, which was milled from 3¾ tons of ore from their mine. D. P. Lewis of the canyon exhibited recently in this city some fine specimens of ore from eight mines which he owns near the Cullen & Miller mine, and all these splendid indications seem to point to a prosperous mining future for that section. Mr. Lewis is down 100 feet in one of his mines, and the ore, which exists in an immense body, goes $11 per ton.

Modoc.

ASSAYS WELL.—*New Era*, Nov. 22: Newt Jacobs was exhibiting a specimen of rock here the first of the week from a ledge recently discovered on Soldier creek, Surprise valley. He claimed that it assayed $64 to the ton in gold, but it was about as worthless looking rock as we have seen, although the ledge may be rich.

Nevada.

PEABODY MINE.—*Tidings*, Nov. 29: The recent strike at the Peabody mine continues full of promise. The strike was made at a point 250 feet in a drift, at a depth of 250 feet on the incline. The ledge is a foot wide and will yield $75 per load right along, while specimens may be found at any time. In the drifts above, the same shoot has been worked and paid very remuneratively, facts which tend to confirm the belief that it is a permanent vein.

VARIOUS ITEMS.—At the H. & H. drift mine at Randolph Flat, considerable water is coming in from the gravel channel cut last week. The outlook is considered quite favorable. The milling facilities on the California mine, in Eureka townsbip, are to be improved. The California is owned by Pat Foley, and is valuable property.

THE SEVEN-THIRTY BONANZA.—*Union*, Nov. 29: Another lot of gold-bearing specimen rock was brought in to the Citizens' Bank yesterday from the Seven-Thirty. The specimens, which were the largest and richest of any yet taken out of the mine, attracted enthusiastic attention. Old miners looked at them with admiration, and declared they were handsomer than 20-dollar pieces. One piece, about six inches in length, was estimated to contain $350. It contained more gold than quartz. The owners of the mine advertised a few days ago to sell 30,000 shares of the stock to raise a working capital, but they have now withdrawn the offer, as the mine is turning out so well that they do not feel it necessary to sell any stock.

MANHATTAN MINE.—Some fine-looking ore has been taken out of the north drift of the 300 level of the Manhattan this week. The ore shows well in galena and in fine gold, and the general characteristics of the quartz is like the best ores of the Nevada district. The vein shows a width of about 18 inches of good milling ore.

RICH SPECIMENS.—*Tidings*, Nov. 28: More rich specimens of gold-bearing quartz were brought to the Citizens' Bank from the Seven-Thirty mine on Saturday. These specimens were found in hard blasting ground, which is encouragement that more of the like kind will soon be forthcoming.

NORTH BANNER MINE.—The mill of the North Banner mine is kept going continuously on good milling ore. The main shaft is now down nearly 400 feet below the drain tunnel level, and is in a fine body of ore.

BEING OVERHAULED.—*Herald*, Nov. 26: The mill at the Nevada City mine is being overhauled and put in good working order. With the tributers and day's pay men there is now quite a force at work at the mine. The company are conducting operations at the new shaft and are meeting with favorable prospects, while the tributers, working at other points on the ledge, are getting out good rock. As soon as the mill is in shape again, crushing will commence.

Plumas.

PLUMAS WATER & MINING CO.—*National*, Nov. 22: The main source of water supply of this company is Silver Lake, situated at the base of Spanish Peak, a natural basin formed by glacier or volcanic action at some remote period, which is fed by snow and springs from the above peak. By building a dam 15 feet high a body of water was formed one and a quarter miles in length by three-quarters of a mile in width, the deepest part in the center of the lake being 114 feet. From this lake the water is conveyed by a ditch with a capacity of 1200 miners' inches to the Mountain House. It is then dropped a distance of one mile and collected in a settling dam, and then conveyed by a ditch to Bear Hill, Gopher Hill, Badger Hill and Shore's Hill. The ditch supplying these points has a capacity for 2000 inches of water. On the line of the system some fluming was necessary, but the main work was in building ditches. As far back as 1871, this company owned the most valuable gravel locations and water privileges combined to be found in the county. This property consisted of 1500 acres on and under their ditch system, including Gopher Hill and a main ditch from Gold and Silver lakes on Spanish Peak, the main ditch being 20 miles in length and five miles of branch ditches. From the Gopher Hill property alone, over $300,000 was extracted by the hydraulic system, but since the unjust decision of the courts regarding this profitable way of mining, the water supply and mining interests have been idle for years, with the exception of a small head of water sold to miners in the district for ground-sluicing, etc. The affairs of the company, which is incorporated, are looked after by Messrs. Thompson & Kellogg, who are stockholders and local managers, and who keep the property in good repair, pending the report of the commission, appointed by the Government to report and devise some measure to permit the working of valuable gravel deposits in this county, and thus place this company, who have expended upward of $100,000 in their water system and mines, to again reimburse themselves for this large outlay of capital now lying comparatively idle.

San Diego.

STRIKE ON THE BLUE HILL.—Julian *Sentinel*, Nov. 26: Gov. Waterman last week cut another good ledge in the 1000-foot tunnel on the Blue Hill. This time it is a four-foot ledge and said to be good milling rock. Before the tunnel is completed we predict that the Governor will have enough in sight to warrant him in putting up machinery equal to that at Stonewall.

GOLD KING AND QUEEN MINES.—Hoisting machinery has been put up on the Queen mine. The hoisting on the King is being done with a whim, but a steam-hoist will be put up here also as soon as the machinery can be hauled on the ground. These mines are only about 100 yards apart. The main shaft of the King is down a depth of 80 feet and levels have already been run about 100 feet on the vein of ore. The shaft of the Queen is down 130 feet and some 300 feet of levels have been run. As yet no stoping has been done in either mine, but from the work already done some 250 tons of very fine ore now lies on the dump awaiting the completion of the new mill. A large barn is to be built as soon as lumber can be had, to accommodate the large number of teams that will be required around the mine. Some 200 cords of wood are stacked up in the yard and more coming every day. At present this company has on the pay-roll at the mine, 25 men, and this number will be increased shortly. The men are well provided with good bunks in the new bunk-house and a boarding-house is right at hand. The Coronado Foundry & Machine Co. have the contract for the erection of the new mill now going up on the company's mill-site in Banner. The mill will have ten 850-pound stamps, two Challenge feeders, a 40-horse-power engine, and a 45-horse-power boiler, and will crush 25 tons of ore per day. The boiler and engine were made in Indianapolis. The balance of the machinery is of home manufacture, made at Coronado. The building that is to cover the mill will be 28x70 feet and will contain 40,000 feet of lumber, the lumber coming from Minear's new sawmill on the Volcan. The lumber is sawed and is being delivered as fast as teams can haul it. An assay office is going up which will be 14x24 feet. The brick for the furnace are on the ground and are of home manufacture, having been made at Cuyamaca, except the firebrick for lining, which are imported. The battery timbers are of Oregon pine and are solid pieces 12x24 inches and 24 feet long. There are 16 men employed here and Mr. Fairfield informed us that he expected to have everything in running order by December 15.

Shasta.

NOTES FROM IGO. — *Courier*, Nov. 29: Some parties from below are taking hold of the Chicago mine and intend to sink on it and develop the same. Robinson & Co. are still working on their group of claims. The Gem mine is being sunk on under the management of A. J. Mason. There is considerable talk of the D. C. T. & F. Co.'s property changing hands soon, as the people living on the line of the ditch are striving to form an irrigation district under the Wright law. Several meetings have been held at Igo and Happy Valley in regard to it. The arastras on South Fork are running on average ore. The China Co. is working a mine at Horsetown on a large scale.

Sierra.

ABOUT ALLEGHANY. — *Mountain Messenger*, Nov. 29: Prospects are bright for a boom in quartz at this place and Chips next year. Wm. Hanley has run 500 feet of tunnel for the old Golden Star lead, at Rapps ravine, and expects to strike it 700 feet ahead. He is going below soon for the winter and Geo. Connors will continue the work for him. John Fessler is still hammering away in bedrock at his claim near Alleghany, and running a tunnel. B. B. Lewis, lately from Pino Altas, New Mexico, is assisting him. Golden King ledge is owned by A. Nihill, H. L. Johnson and G. C. Haskell, who have been crushing quartz with an arastra for the past five months with favorable results. They believe they have as good a milling ledge as there is in this part of the county, as thus far proved. Chimney averages in width from eight inches to five feet. Jas. Clinton is working on the Smith ledge for Chas. Heintzen, the owner, and has fair-looking quartz. J. T. Bradbury continues working at the Sherman ledge, and is raising from the first to the second tunnel, about 70 feet, and as far as he has gone, obtained arsenical sulphurets, which prospect exceedingly well. Wm. Wright is preparing to develop his gravel mine at Kanaka City, this winter. H. H. Brown is employing two men to develop the Kenton ledge, with which the Eagle has been consolidated. This promises to soon become good milling property. J. E. McCormick is working at the Buckeye mine.

CHIPS' FLAT. — Wm. Harp has, report says, taken out over $2000 from his quartz ledge near Chips, this year, which promises well for the future. L. Evans is taking out pay gravel at Chips. The buildings at Chips were mostly covered with snow last winter. A good 12 feet fell. Chas. Roussan is running a tunnel at Oak Flat Ranch seeking for gravel. Some very good-looking quartz is being taken out of the old drift claim at Fir Cap diggings. The ledge was discovered many years ago in working the old gravel diggings.

MINING ITEMS.—*Tribune*, Nov. 28: The Mountain mine has closed down and Supt. Harper has discharged all the men. Much bad luck has been encountered in putting up the new tramway. It broke last week and the mill had to be stopped until repairs could be made. Just as they got it fixed and in good running order it broke again. This is bad news. The mine will remain idle now until new machinery can be procured. A. W. Edwards has let a contract to John Egbers and another party to run 2000 feet of tunnel at his quartz claim up at Gold lake. Mr. A. C. Busch has begun operations at the Phœnix quartz mine. Several men have been put at work there and supplies have been sent up. C. W. Hendel is here doing some surveying for A. C. Busch at the Phœnix mine. Owing to a scarcity of water it has been found necessary to shut down part of the stamps at the Wm. Tell mine.

PROSPECTING.—Tony Grass and Peter Keifler have returned from their prospecting and hunting trip to the Middle Fork. They were gone five days. Tony reports game very scarce up that way. They found a good ledge, however. It is 18 inches thick and the rock shows well with galena.

Siskiyou.

GOOD GRAVEL. — *Telegram*, Nov. 29: George Graves of Honolulu, who is one of the contractors in sinking a shaft at that place for Chas. Junker of this city, was in Yreka Thursday and informs us that pay is very good in the shaft, averaging $25 to the foot, and as they sink above one foot per day it is equal to $12.50 a day per man. He also reports everything as looking favorable for nearly all the other mines in that vicinity. The Rummel mine on the Klamath is being improved by the putting in of a new pump received from San Francisco.

QUICKSILVER DEPOSITS.—Yreka *Journal*, Nov. 26: Preparations are being made by the Siskiyou Consolidated Quicksilver Mining Co. to work their cinnabar ledges or chimneys at head of Beaver creek, Siskiyou mountain, during the entire coming winter, at which at least a dozen men will be employed. In the spring, operations will be carried on more extensively, with the addition of more workers. The advance in silver has also created a greater demand and better prices for quicksilver, which can be obtained in large quantity and superior quality in the foothills of Siskiyou mountain, this side of the Oregon boundary line. The work is under the supervision of Mr. Magee, an experienced and skillful quicksilver miner, who is also noted as an expert snowshoe traveler, formerly residing in the Sierra Nevada snow-belt region of Sierra and Nevada counties. The process of working the quicksilver mines on West Fork of Beaver Creek, in the Siskiyou foothills, will be by means of roasting furnaces, said to be more effective and less dangerous to the health of operatives than the old-fashioned style of retorts. With furnaces, the cinnabar containing 18 to 20 per cent of quicksilver, can be worked profitably, while it takes ore containing 50 or 60 per cent for the retort process to prove profitable.

NEW QUARTZ-MILL.—Ed Sheffield at White Gulch, near Sawyer's Bar, intends putting up a larger quartz-mill than the old one formerly used, and will build it lower down so as to secure greater water-power with the advantage of being able to run the mill all the year round.

Trinity.

LOOKING WELL.—Trinity *Journal*, Nov. 29: The Yellowstone mine on the East Fork is looking well and the mill is running steadily, but the water-supply is only sufficient to run five stamps. These stamps are doing good work, judging by the amalgam in the battery and on the plates. Mr. Hughton will take charge of this property as soon as he is able to get about. At present he is on the sick list and Mr. Skinner is superintending the work.

HAS A GOOD OPINION OF IT.—The Golden Chest M. Co. is running a deep tunnel to tap its ore chute 150 feet deeper than the present level. Mr. Whittier of San Francisco, a wealthy owner in this mine, thinks more of it than any contract he ever had.

Tuolumne.

DRIVING A TUNNEL. — *Independent*, Nov. 29: Work on the Cosmopolite mines is progressing under the superintendence of Wm. Pool. A tunnel is being run to strike the shoot below the old works that yielded many bonanzas in good old days gone by.

NEVADA.

Washoe District.

ON THE COMSTOCK LODE.—*Territorial Enterprise*, Nov. 29: There has been a better feeling in the last few days in the San Francisco mining share market. This has in part been due to the continued successful working of the Dow pumps in the Crown Point mine, and in part to favorable developments in the Overman. The pumps at the Crown Point will drain a large area of mining ground. It should not be a matter of surprise were the lowering of the water to proceed very slowly after the drainage has attained a depth of 200 or 300 feet, as there is in all the surrounding ground the accumulated water of years. This will flow into the openings that are being drained under a heavy and constantly increasing pressure as depth is attained; but once it is out of the ground it cannot return to be again handled. When the old workings have been drained to the bottom only the daily and regular flow—whatever that may prove to be—will remain to be handled by the pumps. There are no discouraging features at any point in the workings of the leading mines; on the contrary, the exploring drifts in several mines are showing ground of a favorable and fertile character. The finding of hunches and stringers of ore, even though of low grade, is always a promising indication, as it proves that the ground is of such a nature that "ore can live in it," as the miners say. There is still an abundance of water in the Carson river, and all the mills on that stream are kept in constant operation. Also the weather continues fine for all kinds of work. The following information has been gathered from the weekly letters of the superintendents:

BEST & BELCHER.—On the 800 level west crosscut No. 1 has been extended 25 feet; total length, 325 feet; formation, porphyry, clay and quartz. On the 1200 level upraise No. 1 has been carried up 10 feet; total hight, 81 feet; formation, hard porphyry.

GOULD & CURRY.—On the 200 level the northwest drift has been extended 12 feet; total length, 107 feet; formation, quartz of fair quality. On the 250 level, west crosscut No. 1 has been extended 10 feet; total length, 35 feet; formation quartz, showing some value. On the 400 and 450 levels from the old stopes have extracted 45 tons of ore of fair quality. On the 625 level all work is confined to repairs.

CROWN POINT.—Shipped to the Mexican mill during the week 407 tons of ore, the average battery assay of which was $13.78 per ton.

YELLOW JACKET. — Shipped on an average 78 tons of ore daily to the Brunswick mill; the battery assays average about $18 a ton. The usual prospecting work is going on on the different levels.

SEG. BELCHER & MIDES.—The 1100 joint east crosscut was advanced 29 feet; total length, 180 feet, and stopped in the hanging-wall. It passed through the width of about 6 feet of quartz, which assayed from $5 to $25 per ton, but below the paying grade of the average. This quartz will be further explored

to the southward on this level and also on the 1200 level, where the crosscuts have not been far enough east to cut it.

KENTUCK.—The 1000 level east drift has been advanced 10 feet during the week, making its total length 168 feet; face in porphyry and low-grade quartz. The west drift on the same level is out 176 feet, having been advanced 11 feet since last report; face in soft ground, composed of clay and porphyry. The north drift from the 950 east crosscut is out 30 feet; face in quartz showing spots of ore.

BELCHER.—No particular change to report of the stopes. Shipped to the Vivian mill during the week 266 tons 500 pounds of ore, the average battery assay of which was $19.26.

CHOLLAR.—Extracted and sent to the mill the past week 535 tons of ore. Average battery assay, $21.85.

POTOSI.—The north lateral drift from the winze station, 1130 level, is out 190 feet; face in porphyry. North lateral drift from winze station 1230 level, is out 48 feet; the face in porphyry. The south lateral drift from winze station, 1230 level, is out 130 feet; face in porphyry. The south lateral drift from the main incline, 1230 level, is out 628 feet, face is in porphyry.

WARD COMBINATION SHAFT.—East drift from the 1800 station is out 700 feet; face in porphyry.

CON. NEW YORK.—The north drift on the 650 level is in 85 feet; face in porphyry. North drift, 850 level is in 431 feet; formation porphyry. The north drift, 1100 level, is in from the shaft 302 feet; formation quartz and porphyry.

SAVAGE.—During the week have hoisted 946 cars of ore from the 300, 400, 500, 600, 750 and 1300 levels. Shipped to the Mexican mill 492¾ tons of ore and to the Rock Point mill 332¾ tons. Milled during the week 735 tons, the average battery assay of which was $20.05 a ton. Have bullion on hand and at the mills amounting to $33,755.33.

ALPHA.—East crosscut 70 feet north of shaft, 600 level, is out 170 feet; formation, porphyry.

HALE & NORCROSS.—We have retimbered 65 feet of the incline below the 1300 level, 40 feet having been newly timbered during the past week; we are also repairing the main vertical shaft.

CON. CAL. & VA.—Ore continues to he extracted from the 1200, 1300, 1500, 1600, 1650 and 1750 levels. Ore of a fair quality is found in places on all these levels. About the usual amount and quality of ore will be shipped to the mills on the river during the week.

OPHIR.—The west drift on the 1300 level continues to show bunches of ore. Ore is also being taken from other points, the average assay of which is a little over $21 a ton.

MEXICAN. — East crosscut No. 1 on the 1465 level continues in porpbyry.

UNION CON.—On the 1465 level, east crosscut No. 2 is still in a soft porphyry formation which shows frequent seams of clay.

SIERRA NEVADA.—The main west crosscut is still being advanced in a favorable mixture of porphry, clay and quartz.

In Con. Imperial & Challenge, Exchequer and Silver Hill the usual amouot of exploratory work has beeo done duriog the week.

JUSTICE.—The north drift, 370 level, was advanced 20 feet during the week, making its total length 208 feet. Face shows three feet of ore giving assays of from $5 to $25 per ton. Shipped to the mill during the week 196 tons 1685 pounds ore, the average battery assay of which was $20.47.

Ely District.

THE FURNACE.—Pioche *Record*, Nov. 22: The furnace, under the efficient managcment of Supt. Weroer, cootinues to run like a clock. From 50 to 60 tons of ore are smelted every 24 hours. Teams are steadily hauling ore aod coal and the force at present employed keeps the furnace going, and if we do not have a very heavy winter a continuous run may be looked for during the winter months.

YUBA.—The Yuba mine is looking better at preseot than it has at any time sioce it was opened. Under the management of Foreman Lloyd new drifts have started, new ore bodies opened. The winze oo the 1300-foot level is in ore that will average 100 ounces io silver per ton. All boisting is done to the tunnel level. The Yuba as it now stands is one of the best pieces of mining property on the Pacific Coast.

Pine Grove District.

THE PINE GROVE MINES.—Carson *Tribune*, Nov. 25: Hoo. J. L. Wilson, ex-Assemblymao from Esmeralda, returned to Pioe Grove yesterday with his gripsack well filled with coin, the proceeds of several gold bars made from last month's run. The Pine Grove mines have already produced about $4,000,000 in gold, and tbere is said to be plenty more in sight.

THE WOLVERINE DISTRICT.—*Chronicle*, Nov. 26: Messrs. Fitzmeyer aod other owners of the Badger and Wide West claims in this district, about 12 miles northeast of Virginia, and supposed to be a continuation of the Comstock, are getting out very favorable rock. Some of the rock examined by experts carries a good deal of gold, and all the character of the rock is good enough to have shipped to Salt Lake to be worked.

Hawthorne District.

WORK TO BE RESUMED.—Walker Lake *Bulletin*, Nov. 26: The prospects are good for a general resumption of work in Hawthorne district this winter. It is too bad that the richest mining district on tbe coast should remain undeveloped. The owoers of the gypsum mines near Lovelock bave commenced operations. Roads are being built to the mines, and the deposit is being opened. This is said to be the best and largest gypsum body in tbe world. It is expected that work will be resumed in the Pamlico mine some time oext month. It is reported that the miners in the Big Indian mine have struck a ten-inch vein of rich ore. The Lapanta is producing bullion right along. The prospects are very encouraging io this mine.

THE MOUNTAIN QUEEN.—Good work is being done at the old Columbus Con. mine, near Candelaria. Eastern capitalists have placed a large amount of money io the property, and under the supervision of Mr. Chas. T. Warren it is believed that the mine will soon be a large dividend-payer. The property is now called the Mountain Queen.

STATE LINE MINES.—Indications are good for a bang-up camp at Gold Mountain. The State Line Con. Gold Mioing Co. is paying up old bills and intends doing developmeot work oo the State Line mines, Lew Hanchett has charge. John B. Truman has sent in for county license to do merchandise and boarding-house business.

LOOKS LIKE BUSINESS.—White Pine *News*, Nov. 22: We learn that the Eberhardt Co. has purchased the Green Springs property (Freeland's place), nine miles below Eberhardt. The object of the purchase is said to be to use the water for milling purposes. The company considers it cheaper to haul the ore to the Springs than to repair the old water-works, which are in a dilapidated condition. As the purchase was doubtless at the instance of the chairman of the company, who is on a tour of inspection of the property, it looks as if the old Eberhardt meant to resume operations at an early day.

ALASKA.

FROM THE MINES.—*The Alaskan*, Nov. 12: At the several localities where vein mining is in progress this branch of the business is being actively and successfully prosecuted. As a general thing, however, the season has not been a prosperous one with the placer miners, the warm weather setting in late, much rain falling and many of the streams remaining high until late in the summer. The census nearly completed, shows the population of Alaska to be about 31,000, divided as follows: Whites, 2000; Creoles or half-breed Russians included, a little less than 5000; Esquimaux, about 17,000, Athabascan Indians about 8000; Aleuts 1000; the pure-blooded Russians not exceeding half a dozen.

ARIZONA.

FROM THE MAMMOTH.—Tucson *Star*, Nov. 25: The latest reliable news from the Mammoth country is that the Mammoth mine and mill are running steadily on Mammotb ore, and the mill, under Baron Inderstroth's able management, is turning out gold bullion galore. The strike in the Table mountain mines, which the *Star* mentioned casually a short time since, is now fully confirmed. This ledge samples across the 22 feet $86.40 in gold and 13½ per cent of copper. This find is an assurance of a permanent camp upon the valley of the San Pedro, and Tucson people must look to their interests and see that the proposed road is built, for Tucson is the point upon the railroad from wbich this promising district must naturally draw its supplies, and we predict a great increase in traffic to Mammoth, as we know of two plants about to be erected in that vicinity.

NEW PROCESS.—Tombstone *Prospector*, Nov. 23: One of the most important questions to be solved before Arizona can expect to become prosperous to the degree for which Nature has fitted her, is that of working the ores that are so abundant in every mountain range, but which have not been touched for lack of water with which to reduce them. The first attempt to cut away from the water proposition and experiment with a dry process was made, or rather is being made by the Silver Chief M. & M. Co., which has just filed articles of incorporation. The plant alone after erection cost close on to $75,000. The tramway which leads from the mine to the mills is one mile long and cost $20,000. The ore is handled but once, and after leaving the mioe is not touched until it is in the shape of concentrates. The three mills crush 40 toos of ore per day of 24 hours, and the concentrates represent as compared to tbe ore rate of ooe to five, that is, five tons of ore which runs in gold and silver $30 per ton is reduced to concentrates worth $150. The only water used is for the boilers of the power used to run the mills and concentrator.

BRITISH COLUMBIA.

SILVER MINE.—Kamloops *Sentinel*, Nov. 22: Some miners have been doing work on a ledge located by them last summer, about 60 miles up the North Thompsoo river. They have sunk 30 feet on the ledge and drifted 17 feet, and are satisfied they have located a valuable property. The ledge is three feet wide aod looks exceedingly rich. Assays from samples brought down, Mr. McDooald says, do not indicate that it is a low-grade ore, though he does oot care to make public the exact result of the test uotil he cao bring a larger quantity down. He has worked hard and with little eocouragement for years at prospecting, and it is gratifying to know that he is likely to be well rewarded for bis determined efforts. He cao get any amount of capital to work the claim and is saoguioe of making a good stake. He predicts lively times prospecting and mining up the North Thompson next season.

REVELSTOKE NOTES.—*Star*, Nov. 25: A sample lot of two tons of gold ore bas been received at the smelter this week, shipped in hy M. S. Davys. It is from Rover creek, which runs into the Kootenay river between Sproat and Nelson. The sample runs high in the yellow metal.

PAY GRAVEL.—*The Miner*, Nov. 26: John Loge, an old-time placer prospector, who would rather locate 100 feet of pay gravel than 10,000 feet of low-grade quartz croppings, is the lucky finder of a placer claim in the Toad Mountaio district. While prospecting with Sam McCaskill, they struck what they were in search of on a creek that empties into Salmoo river. The discovery ground is oot more tban six miles from tbe Hall mines and is easily accessible. The diggings are sballow and the gold coarse. The 14 pans washed yielded between $3 and $4 in gold, ooe pan yielding over a dollar's worth. Mr. Loge estimates the diggings to be worth fully an ouoce a day to the man. A rusb may be expected to the creek early in the spring, as there is plenty of water and a considerable area of workable ground. While the output of our placers will never equal that of our quartz mines, tbe yield from this new creek, combined with that from the hydraulic claims on Forty-Nine creek, will help to swell the total output next year up to a figure with six ciphers after it.

COLORADO.

THE LARGEST IN GILPIN COUNTY.—*Register-Call*, Nov. 28: The largest ore-producer in Gilpin county at present writing is that of the San Juan on Quartz hill, which bas a daily output of 16 cords. The mine furnishes a sufficient amount of ore to keep 70 stamps running daily—30 at the Hidden Treasure mill and 40 at the New York stamp-mill in Black Hawk. At a safe estimate there are 500 cords of ore broken in the mine ready to be hoisted to surface for treatment, whicb at an average of 8 tons to the cord would be a total of 4000 tons of ore.

COLORADO'S PROGRESS.—*Mining Industry*, Nov. 26: The Rio Grande Southern, which will give railway facilities to the rich mining region surrounding Telluride, Ames, Front Lakes and Rico, is now completed nlmost to Telluride, a distance of 50 miles from the starting point at Dallas. So far as one can judge from surface indications, and from the comparatively little development that has been done, there are few regions in the world which equal it. The richest ore which goes to any market in the world comes from there. The Sheridan, Smuggler, Union, Mendota, Virginius, Enterprise, and others less known to fame, are shipping ore all the time in carload lots which runs from $300 to $5000 per ton. A carload of ore from the region which brings $30,000 is no uncommon thing.

SAN JUAN COUNTY.—Silverton *Miner*, Nov. 22: The Yankee Girl is stocked for $2,500,000 divided into 280,000 shares at $10 each, and the stock is non-assessable. The shares are worth to-day $5 each and a dividend of 50 cents a share was declared October 3d, making the entire amount paid by this mine $1,325,000. Development on the North Star on Solomon is proving all that was anticipated of the recent rich strike. It is undoubtedly the finest body of gray copper in the county. The owners, who have always been conservative in matters of this kind, think the new ore body is worth anywhere from $750,000 to $1,000,000.

PITKIN COUNTY.—Aspen *News*, Nov. 27: The Aspen Mining and Smelting Co. in common with all the other producers of the camp, is in a bad fix because of the failure of the railroad companies to furnish sufficient cars for the transportation of ore. The company has, at several times, had agreements with one road or the other to furnish from seven to eight cars daily, but the railroads have not been able to live up to their contracts. The company has been making a good record, notwithstanding the many difficulties under which it has labored. Regular dividends have been maintained, and there is now a sum in the treasury sufficient to pay the next three.

CLOSED.—The Smuggler mine was compelled to shut down yesterday for want of cars. This will take 60 tons a day from the output of the camp. As there is no prospect of cars to meet the freight demand, the mine will remain closed indefinitely.

IDAHO.

CŒUR D'ALENE.—Wardner *News*, Nov. 22: A. B. Campbell keeps 75 men on the pay-roll of the Milwaukee M. Co. The Gem mine is looking better than ever, and averages a shipment of one carload of concentrates daily.

BLACK BEAR.—The new mill of the Black Bear Co. was started up for the first time on last Sunday. The machinery worked to a charm and was run long enough to pronounce its trial a success. The electric plant was tested on the same day and proved in every way satisfactory.

KETCHUM'S PRODUCT. — *Keystone*, Nov. 29: There was shipped from this place during the week just closed 383,229 pounds of ore and 89,481 pounds of bullion.

WAITING FOR TRANSPORTATION.—The Elmore *Bulletin* says that there are good gold mines at Pine Grove on the South Boise river, 12 miles from Junction bar, but the gold is mostly in the iron pyrites, and adds: Should the cootemplated railroad be built along the South Boise it will penetrate one of the best mining regions in Idaho.

LOWER CALIFORNIA.

FROM THE MINES.—*Lower Californian*, Nov. 27: Some excellent specimens of gold, silver and iron ore were brought in from Guadalupe valley the past week by Matias Moreno and Juliao Rodriguez. They also show fine specimens of talc from a mine recently discovered, and which promises to become a source of wealth to the owoers.

A SPECIMEN of silver ore from a ledge situated within three miles of town is exciting the interest of mining men in Ensenada. As the finder of the ledge has not yet denounced it, the particulars are known to but few persons.

RUMORS are current that rich mineral has been found in the Purisima valley, 300 miles south of here.

MONTANA.

VARIOUS ITEMS.—*Review*, Nov. 28: A rich strike is reported in the Dandy mine, Seven Mile district, of three feet of ore, which assays 60 per cent lead per ton. This property is owned by J. Kingsley, of St. Paul, Mino., who, about a year ago, bought it from J. A. and F. C. Hudson. Mr. R. A. Bell, of this city, has some as fioe samples of Montaoa marble as we have ever seen. It comes from near Blackfoot City and will hold its own with Italian marble in beauty. Ore shipments continue from the Cumberland mine at Castle. A fine body of copper ore is said to have recenlly been encountered in the Comstock lode, Basin district. The new placer diggings discovered about four mooths since in Freoch gulch, Beaverhead county, are said to be producing considerable gold. A gentleman in the city from Phillipsburg last Saturday, states that large quaotities of ore are being shipped out of tbat city from the Flint creek mioes. The Bi-Metallic has declared its regular monthly dividend of 35c, aggregating $70,000. The Granite Mouotain Co. have applied for and obtained patents for 31 mining claims this year.

A BIG SMELTER.—*Inter-Mountain*, Nov. 20: The Butte & Boston Co. has decided to build a 3000-ton smelter at Great Falls, and to do so without unoecessary delay. Some of tbese days Great Falls is very likely to become the second city in the State.

NEW MEXICO.

COPPER, SILVER AND IRON.—Rio Grande *Republican*, Nov. 22: The copper and silver properties of the Organ mountain regioo are showing up superbly. Ao expert coal miner claims that a coal measure runs east of Las Cruces only three or four miles. He claims that it is the same as the Carthage coal belt and that black sbale and sandstone crop out in places. Al Culver and Al Dowos were out to their prospect six miles west of Randall station, this week. They brought in a sack of iron ore which runs about $6 per ton io gold. They have a shaft down 20 feet and prospects for a mine are good. J. F. Berry of El Paso was up this week to see a prospect in the Organ mountains which assays $78 in gold. It is claimed that there is a 3-foot lead.

SHIPMENT.—A carload of ore goes from the Home claim this week to Joplin, Mo. It is of zinc and lead.

REORGANIZED.—*Southwest Sentinel*, Nov. 25: It is reported that the Billings Smelting Co. at Socorro has recently been reorganized, and that Colorado capitalists now control the concern

RICH ORE.—J. J. Dodd, general manager of the Alhambra Silver Mining Co. of Silver City, was in Socorro on Wednesday last, with about three tons of ore from that famous mine, taken from the shaft while sinking a distance of a little over ten feet. The ore, we should judge, is worth from $5000 to $6000.

OREGON.

HYDRAULIC MINING. — *Plaindealer*, Nov. 22. According to the report of B. C. Ward, engineer of the Myrtle Creek mining ditch, 10 of 27 miles will be completed in a few days. This ditch will be an average of five feet at the top, three feet at the bottom and two feet deep. The water will be taken out of the East Umpqua river and led over to Myrtle creek. The company has ordered 200 feet of 15-inch hydraulic pipe and two giants of 1000 pounds each. They propose to work the mines this winter with both giants. Southern Oregon opens a fine field for hydraulic mining, there being many valuable properties of this kind in that section of the State. The conditions here for operating by the hydraulic method are exceptionally good, nor is there any danger of their ever being interfered with by the land-owners, the Government or any other parties.

THE PINE CREEK MINES.—It is said that Cornucopia, the seat of the Pine Creek mines, is more prosperous now than ever before since the discovery of the camp. The Oregon G. M. Co. is carrying on its operations more extensively than ever, and other mine-owners are prospecting work industriously.

SOUTH DAKOTA.

SPRUCE GULCH.—Deadwood *Pioneer*, Nov. 27: Discoveries of ledges carrying 26 ozs. silver and $4 gold per ton have been found in Spruce Gulch. It is hoped that this will prove a valuable addition to the mineral industry of that district.

GALENA.—The Ontario mine at Galena is improving with every fresh foot of development. The main tunnel is in about 300 feet and shows all the way a vein of carbooate ore, ranging all the way from four to six feet thick, that will average $45 a ton. Crosscuts have been run from the tunnel for a distance of 40 feet, and in no case have they been out of ore. Some high-grade lead ore is also found in this mine.

WILL START UP.—Supt. Havens, of the Richmond, intends starting up the mill at Galena next spring. It will be run principally on ore from the Richmond, but custom ore will also be treated. There is a large amouot of dry ore in Galena that can be worked in the mill, but will not pay the expenses of shipmeot to Omaha.

UTAH.

A BIG SMELTER NEEDED.—*Tribune*, Nov. 27: Salt Lake City was for a long time regarded as the best ore market in the West. Perhaps it has lost oone of its advantages, having good local smelting plaots, besides buyers of ore for the Denver and other markets. The time has come for a great smelting and refining plaot here. There is no reason why we should send a pound of ore to Denver, Omaha and other places, except that the present smelting plants here are not large enough to use up all the ore produced here, and then the railways like to carry out the ore, while the local buyers, of course, work for the concerns for which they are agents. The *Tribune* believes that one of the largest smelting works in the West will soon be located somewhere in the vicinity of Salt Lake City.

TINTIC DISTRICT.—The vein of ore in the Wolf is becoming larger and richer. Mat Condon has been looking after his mining ioterest here this week. Aoother big strike of horo silver ore is reported io the Centeonial-Eureka. Seth Brelsford has locatcd a claim which he calls Free Coinage, because people cry for it. The Keystone is sacking a great deal of ore, it being too rich to sbip in the ordinary manner. The Lancaster has considerable ore on the dump, but will not ship until silver comes up a notcb or two. A very promising claim was located this week by D. J. McKinnon, G. T. Bridges, W. H. Kissinger and Seth Brelsford. It lies west of the Jenny Liod Springs and has an old shaft on it which sbows a 13-foot vein. An assay will be obtaioed soon. It is a wonder that the ground was not relocated long ago. About 200 location ootices have been sold at this office this month, which is a gentle hint that if you want ground in this district you had better get it soon. The body of horn silver recently struck in the Keystone and mentioned in these columns last week is proving to be a bonanza of the biggest kiod. It is stated that $7,000,000 was receotly refused for the Gemini group, of which the Keystone forms a part. O. P. Rockwell brought some rich lead ore, carrying high in silver and gold, to town, Wednesday. The ore was obtained from the Mammoth, located 60 miles west of this district. He says he has a 13-foot veio of ore, and if oit is all as rich as the samples the property will rival its famous namesake. The mine is owned by Mr. Rockwell, Milt Price and James Chipman, the latter of American Fork. The ore was struck at a depth of 40 feet.

WASHINGTON.

KOOTENAI.—*Spokesman*, Nov. 25: There will be much work done in the Lower Kooteoai country this winter. There is no reason why a large smelter should not be put up there, as they have the material to build one and the ores to keep it running. The Hall people have just finisbed sending out 2500 tons of sacked ore. They say it will run $400 and $500 to tbe too. Of course it is picked ore, carrying silver and copper. The natural outlet for ores in that region is this way. The Halls will keep right on: Dr. Campbell will work quite a force on his claims at the Hot Springs. Winter work will be kept up at the Dandy, the Silver King and the Wheeler claims, all with quite a force.

MECHANICAL PROGRESS

Iron vs. Steel for Railroad Axles.

It seems not a little strange at this time of day for steel to be replaced by iron, yet it is stated that such a change is being made in respect of axles for some of the Indian railways. The exact reasons for the alteration have not as yet been made known clearly, but the new state of things is in operation already—the Bombay, Baroda & Central India Company having contracted for 3000 Lowmoor iron axles, to be delivered at the rate of 500 monthly. The substitution of iron for steel in this respect is so contrary to the general tendency of metallurgical practice that we are entitled to make very thorough inquiries on the subject. Having done so, all we can ascertain is that Sir A. M. Rendel, whose list has served to effect the alteration, is of opinion that "commercial steel when used in axles seems subject to deterioration, which makes it very brittle after a few years' wear." This very serious indictment of steel is to some extent supplemented by the following further statement of the same gentleman:

"I originally recommended the use of steel for axles on the Bombay, Baroda & Central India meter gauge because I thought that steel was not only better than iron, but because its price was not more than half that of the class of iron suited for axles. I was further moved to do so by an opinion that, while steel was improving in quality and daily taking the place of the best classes of iron, the quality of those classes of iron must deteriorate, because the price obtainable for them must diminish. In respect to the relative price of steel and iron, I was quite right; in respect to their relative suitability for axles, I have been wrong, or, at any rate, premature."

Until full particulars are furnished, all controversial discussion on the subject must be purely academic, but with the very practical drawback for the steel-axle makers that Indian orders are being lost to them. As a matter of theory, as well as of natural commercial rivalry, there is plenty to be said on behalf of both kinds of axles; but it is a very strong argument for steel that, on every leading line of railway in Great Britain and the majority of lines in other parts of the world, steel axles are in general and successful use. As nothing is said to succeed like success, this is probably the strongest argument which can be used by the makers of steel axles. They have plenty of other arguments. Steel is about half the price of iron for this purpose. The steel is made with the greatest certainty and regularity, and resulting freedom from mishaps. Anywhere out of India a locomotive superintendent adhering exclusively to puddled iron axles would be looked upon in the same light as a gunmaker who used iron for modern big guns, or the shipbuilder who used best Yorkshire iron for the skin-plating of his vessels.

What the steelmakers lose, however, the iron-axle manufacturers will gain, and it is only just to the latter to say that they make a very good fight for their old-fashioned, but, as they claim, safer material.

MACHINE MADE TOOLS.—There are very few lines of manufactured articles that have not undergone wonderful changes, especially in the means and methods of their production, in the last half century. Hand work has been succeeded by machine work, and notwithstanding the very common argument against this change, the claim being made that the quality of the work is thus less accurate and perfect, it is a fact that not only is it more accurate and perfect, but every piece is exactly alike, the quality equally good, and the quantity largely increased. A machine once carefully and accurately set and kept in proper repair never varies. The work is uniform and true. An example of this is well illustrated in the manufacture of that very useful article in every shop and factory, the file. It is but a few years ago that these were all, or nearly all, made by hand, enhancing their cost and not materially increasing their durability and service. To-day nine-tenths of all the files used in this country are made by machinery. The competition in the business, largely controlled by quality, has worked to make their manufacture one in which the most perfect machines are necessary, and this spirit of rivalry has brought the machines to such a state of perfection that wonderfully fine and accurate work is accomplished by them. With the machines now in use, a file is cut with teeth varying from 14 to the inch to a number so fine as to require a magnifying glass to count them, and as accurate and perfect in shape as the coarser cuts. For their production about 5000 tons of specially prepared steel are consumed annually.

HARDENING CAST IRON.—We are informed that the Abbott Machine Co., 47 and 49 South Canal street, Chicago, have lately been conducting some very satisfactory experiments in hardening cast iron by a new chemical process. Briefly described, the mode of procedure is as follows: The iron is put in a furnace and heated to the proper temperature, when the chemical is put on the upper side and goes right through it, so that when cool the under side is as hard as the upper side, and when broken the iron is as hard inside as outside. No trouble is experienced in going through six inches, and the chemical can probably go through any reasonable thickness. In Chicago it is being used for hardening brick dies made of cast iron, whereas heretofore brick dies were necessarily made of steel. This is a great saving both in material and work. Another use is for shoes on grips of cable cars, the iron shoes formerly used sometimes not lasting more than one trip.—*Western Machinist.*

SIMPLICITY IN DESIGN.—Next to good fitting, there is nothing which tends so much to the good repute of a mechanic and his products as persistency in some simple form or style in the finish and ornamentation of his work. If the work be a machine, all of the visible shafts, bolt, stud and nut-endings should be turned or milled carefully to the same general shape or form. There is nothing so neat and appropriate as the simple reverse curve style, free from corner or head. Inward corners should always be avoided. There is nothing so discouraging in machine cleaning as complicated headings, or in house cleaning as complex moldings; they are only dirt-catchers, void of beauty. It is no light task to keep a complex machine like the railway engine clean and tidy; the finish and ornamentation of such machines should by all means be made as simple as possible. Neatness and utility should be the only objects in their construction, and elaboration in the way of show should be avoided. The propriety of using so much brass in the external finish of locomotives has been questioned; it tarnishes so easily that an almost continual rubbing is necessary to keep it bright, imposing a tremendous task on patience and muscle. Paint and varnish judiciously applied occasionally, especially to all of the large surfaces, such as cylinder and steam-chest casings, would be far more neat, economical and satisfactory.—*Ex.*

THE GROWTH OF INVENTION.—It would be impossible to make the circle any rounder, or a right angle greater or less than 90°, or the circumference of a circle greater or less than 3.1416 its diameter, yet it does not follow that mechanical combination is at an end or even approaching it. The growth of invention is much like that of the banyan tree, whose branches turn over and extend to the ground, take root, and each duplicate the operation, the new growths repeating indefinitely. The invention of George Stephenson was a trunk growth, from which has sprouted and propagated a myriad of inventions, called into existence by the requirements of railroad construction and service. Who would have thought of a car coupler before a railroad or car was thought of? Brakes, trucks, nut locks, rail joints, rails, in fact, every detail of construction has been copiously elaborated and the end is not yet. The discovery of electricity and the mechanical appliances following in its train is thrilling in its extent and scope, and no one can tell what is in store in the near future. It seems as if the floodgates are open, and inventions form a torrent which promises no ebb. So of numerous other "trunk" inventions that might be named.—*Ex.*

STEEL RAILROAD SPIKES.—Another illustration of the manner in which Bessemer steel is supplanting iron is seen in the announcement that steel railroad spikes will soon be put upon the market and made from soft Bessemer steel. It is not a great while since the change from iron to steel in splice bars was successfully made. Steel spikes have been made heretofore merely as an experiment, but a Pittsburg firm will soon put them upon the market for the first time for general use. For the substitution of steel for iron in this line of manufacture, there are several reasons. For some time past, old rails have been getting scarcer, until it has become impossible to secure an adequate supply for making spikes. Several causes seem to have combined recently to advance the price of muck bar, and consumers were practically compelled to look to Bessemer steel. Of course steel spikes will not immediately displace iron, as the first firm entering the market will continue to use muck iron. In all probability, however, steel will eventually drive out iron in this line. The opinion of railroad authorities is seen in the fact that at the latest convention of roadmasters, held in September last, the associations indorsed a steel spike in preference to iron.

OXIDATION AND MAGNETIC PROPERTIES OF MANGANESE STEEL.—Drillings of manganese steel, with 25 per cent and less of manganese, prove magnetic after being heated, according to Mr. L. T. O'Shea, in a paper recently read before the British Association. The cause seems to be an oxidation resulting in the formation of magnetic oxide of iron. When this oxidized steel is reduced by heating in hydrogen, the drilling appears powerfully magnetic, probably because the former iron manganese alloy has been destroyed, and metallic iron and manganous oxide, MnO, have been formed. Manganese is very susceptible to oxidation, but the determination of the exact proportions of the two oxidized metals is no easy matter. Filings show magnetism after heating, because the oxide coating adheres to the filings; when manganese or steel masses are heated, the oxide scales off and leaves the mass free from oxide.

AIR ABOVE BURNING COAL.—A certain amount of air admitted to the furnace above the live coal is advantageous rather than otherwise, if the supply be regulated. The oxygen of the air thus introduced assists in the more effective combustion of the gases.

SCIENTIFIC PROGRESS.

A HOUSE-FLY PARASITE.—An interesting entomological discovery has recently been made in New York. State Entomologist Lintner recently received from a Gonverneur lady an interesting parasite on the common house-fly, says an Albany dispatch to the New York *Times*. "It is not uncommon to find half a dozen on a single fly," the sender writes. They are exceedingly small, being no larger than the puncture in a piece of paper by a small-sized pin point, yet they are seen readily because of their light vermilion color. The favorite spot is on the body of the fly underneath the bases of the wings. The parasite is a mite of the group known as the "harvest mites," bearing the scientific name of *Trombidium muscarum*, and is similar to another species that attacks flies in Europe. The mite does not multiply, unfortunately, with sufficient rapidity to do much toward the reduction of the number of house-flies. While infesting the fly it is in the larval stage, and only after leaving it does it become mature and begin to propagate. For this reason it rarely comes under observation, and has seldom been recorded by entomologists. Another species of mite sometimes met with produces its young upon the house-fly with such rapidity that in a few days the body, head and limbs become completely covered with the parasite. The fact has been spoken of often that the usual number of flies were not seen this season. The reason for this would be interesting, whether an undiscovered parasite or some new form of disease has destroyed them.

OBEDIENT TO THE SUN.—It would almost seem as if our globe were always trying to escape from the thralldom of the sun, which, knowing how fatal to us such an escape would be, incessantly interferes to prevent it. If only the sun were to withhold that attractive power by which the earth is maintained in the course at present followed, dire calamity must result. This globe of ours is now hurrying along at a pace of 18 miles a second, and if the sun's attraction no longer restrained us we should not continue to revolve in a circle, but would at once start off in a straight line through space. Every minute would take us more than 1000 miles, and by the time 100 days had elapsed we should be twice as far from the sun as we are at present. His light and his heat would be reduced to one-fourth part of what we now enjoy. With every successive minute the sun's influence would still further abate, and it is almost needless to add that all known forms of life must vanish from the globe. It is, therefore, satisfactory to know that we possess every security that the sun's attraction will never decline from what it is at the present moment, and therefore there is no ground for any apprehension that life shall be chased from this globe by a dissolution of the bond of attraction between the earth and sun.—*Good Words.*

TORNADOES AND VIOLENT STORMS.—A special investigation of the subject of tornadoes has been carried on by Prof. H. A. Hazen, of the Government Signal Service, during the past year. Prof. Hazen divided the tornadoes into three classes. First, violent storms causing destruction; third, the most severe tornadoes; and placed in the second class all other known violent storms. While there were about 1000 tornadoes each in classes one and two, causing the death of 1071 people, an average of one person to two storms, and a loss of about $23,000,000 in property, yet there were but 58 tornadoes of a very violent character, killing 755 people and destroying property to the amount of $11,894,700, an average loss of 13 lives and over $200,000 of property to each storm of class three. It appears that in no State may a destructive tornado be expected oftener, on an average, than once in two years, and that the area over which the total destruction can be expected is exceedingly small. In the last 18 years the death casualties from tornadoes averaged 182 annually. While this is a large number, it does not appear to be as great as the death casualty from lightning. It may be safely assumed that, dangerous as are tornadoes, they are not so destructive to life as thunder-storms.—*Scientific American.*

DOES THE SUN GIVE LIGHT AND HEAT TO THE EARTH DIRECTLY, or is heat generated by the action of the sun's rays upon the earth? is a question which has interested and puzzled many of our best scientists. The *Scientific American* refers to the matter as follows: "The sun's heat is supposed to be transferred to objects by ether waves. These are not considered to be heat, but to be capable of producing heat when they impinge upon matter. The atmosphere being attenuated and thin in the upper regions, is less heated than in the more dense portions near the earth. The heating power of the sun is also very great at high altitudes when radiating upon surfaces properly prepared to receive and absorb the heat. The nearer we approach the sun, the more powerful are the radiations or ether waves."

EFFECT OF ELECTRIC LIGHT ON PLANTS.—A beautiful illustration of this was recently given by Dr. Siemens before the Royal Society of England by placing a pot of budding tulips in the full brightness of the electric light in the meeting-room, and in about 40 minutes the buds had expanded into full bloom. Dr. Siemens stated that he had planted a number of quick-growing seeds, such as mustards, carrots, melons, etc., and having divided the pots into four groups, had one group kept entirely in the dark, one exposed to the influence of the electric light only, one to the influence of daylight only, and one to daylight and electric light in succession. He applied the electric light each evening from 5 to 11 o'clock and left the plants in darkness for the remainder of the night. According to his observations, the plants kept entirely in the dark soon died; those exposed to the electric light only, or to the daylight only, throve about equally, and those exposed to both day and electric light throve far better than either.

LIGHTNING AND RAILWAYS.—It has been demonstrated on different occasions that lightning cannot strike a train. We see trains pass through a storm, running in the full evolution of the field to the point that the wheels are surrounded by luminous electric arcolas, and the way gives off sparks; the thunder growls inoffensively around and even above the train. This immunity is explained by the fact that the rails are never electrically isolated from the ground, and that they form conductors of great section, across which the atmospheric electricity is drawn by the nature of the materials constituting the train, and by its movements flows easily toward the soil. The theory well established, nature has charged itself to give it a complete contradiction. At Dischau (Prussia) an express train, running at the rate of 60 kilometers per hour into the station, broke down the buffing apparatus and traversed the interior facade of the station, breaking up against a neighboring house. An investigation established that the accident is to be attributed to the effects of lightning, which fell upon the train, killing outright the driver and stunning the stoker.—*Cosmos.*

CURIOUS FACTS.—A relationship between the flora of Eastern Asia and of Eastern North America was pointed out, as to Japan, by Dr. Asa Gray, 30 years ago. It has been illustrated since by discoveries of new species alike in both regions, but they have been for the most part unimportant herbs. Greater force is now given to the fact by the discovery, by Dr. Augustine Henry, that the Chinese and American tulip trees are identical. The discovery is significant in that it gives evidence that the climates of Eastern America and of China have continued to be alike since the Tertiary period. At an exhibition given by the Department of Microscopy of the Brooklyn Institute, exhibits were shown, and one of them consisted of teeth of a mosquito, showing 11 teeth at the extremity and upon the thin edge of each flattened, bristle-like mandible. Another side showed the stinging hairs of nettle, how the top of the sting is broken off on entering the skin while poison from the gland below is pressed through the tube of the sting into the flesh. Thus are insects and plants provided with instruments of torture for men, though these are only two minor examples of hundreds of tortures to which we are liable.

"THE RULE OF THUMB" is made of very important usefulness in China. In that country a traveler wishing for a passport is compelled to have the palm of his hand brushed over with fine oil paint; he then presses his hand on thin, damp paper, which retains an impression of the lines. This is used to prevent transference of the passport, as the lines of no two hands are alike. The cunning Chinese have also discovered that the impressions of no two persons' thumbs are alike, and also that the impressions of no one person's two thumbs are alike. The European police keep books of photographs to identify criminals; the Chinese police keep merely impressions of each criminal's two thumbs, carefully labeled and numbered. He may shave, he may appear young and lithe or old and crippled, but he cannot alter the impressions of his thumbs, which can at any time be traced on paper and compared with the impressions always kept in safe custody by the celestial detective force.—*London Globe.*

A MODUS OPERANDI FOR GETTING A SPARK.—A very simple apparatus for obtaining an electric spark is made by a German physicist. Around the center of a common lamp chimney is pasted a strip of tin foil and another strip from one end of the chimney to within a quarter of an inch of this ring. Then a piece of silk is wrapped around a brush, and the interior of the chimney is rubbed briskly. In the dark, a bright electric spark may be seen to pass from one piece of tin foil to the other each time the brush is withdrawn from the chimney. Many other experiments can be tried with this apparatus.

GLACIERS IN THE ALPS.—A recent survey has established the number of glaciers in the Alps at 1155, of which 249 have a length of more than 4½ miles. The French Alps contain 144 glaciers, those of Italy 78, Switzerland 471 and Austria 462.

PASTEUR'S RESEARCHES on the phenomena of brewing led him to discover a number of micro-organisms, the presence of which is the cause of serious diseases in beer and other fermenting liquids.

THE reported destruction of the Pyramids for building materials arose from the removal of loose stones at the base to lay bare the lower courses and display the structures to greater advantage.

ELECTRICITY.

Increase of Traction by Electricity.

We recently reprodnced from a tecbnical paper a statement, accompanied by wbat has been considered quite satisfactory proof, that an electrical current passing through the surfaces of contact of a car-wheel and a rail upon which it ran would greatly increase the tractive-power by increasing the friction between the wheel and rail. This increase was estimated at from 20 to 25 per cent with a current of 30 amperes. Now comes L. I. Blake, Professor of Physics in the State University of Kansas, who says he has made a series of experiments which show that there is no appreciable difference in the friction by adding the current to the ordinary friction. He made four wholly independent laboratory experiments, of course in a small way. His statement concludes as follows:

"The currents employed were not sufficient to produce heating at the surfaces of contact. Such heating would doubtless produce an increase of the coefficient of friction. The four wholly independent methods (which he describes with illustrations) would seem to justify the conclusion that the friction of rolling or sliding contacts is not affected by the electric current passing through the surfaces of contact, provided the currents are not strong enough to produce sensible heating effects. Whether such heating effects occur between wheel and rail in electric railways when transit is rapid, may well be called in question."

ELECTRICITY DIRECT FROM HEAT.—Among the many problems which electricians and electric inventors are constantly studying, none is more important than the one se to producing electricity directly from heat, without the interposition of dynamos or any other mechanical contrivance. In this connection it is interesting to notice a series of patents recently granted to Col. J. A. Price, of the Sorenton (Pa.) Stove Works, in regard to a new method of ventilating cooking stoves. In a patent, bearing date of July 29, 1890, the inventor broadly hints at electrical expression in his handling of the air currents in the oven. The approach to this result is gradual and is characterized by considerable caution in the following quotation: "The currents of air so produced also seem to exert an electrical effect in the oven, which I attribute to the movement and heated application to the oven, as there is an intensity of action not otherwise accounted for." He further says: "The products may be said to be oxygenated instead of carbonized . . . and thus become a useful factor, combining, so to speak, a chemical with the mechanical action of the air." It will be seen from the above that Col. Price does not as yet claim to have produced electricity direct from heat, but he seems to be on the way toward this desirable result. In regard to the oven, the system inaugurated appears to be one of a lower temperature than is generally necessary to do effective work, or lower than has ordinarily been considered safe. The claims are that even with this condition established more rapid service can be attained, while the loss through destructive distillation is greatly reduced.

THE ELECTRIC MOTOR'S WORK.—The New York *Sun* thus speaks of electric power, in which the various work of the motor is summed up as follows: In some cities, so far has the use of electric motors gone that it is possible for a man to drink, at breakfast, coffee ground and eat fruit evaporated by electric power. During the morning he will conduct his business with electrically made pens and paper ruled by electricity, and make his records in electrically bound books—his seventh-story office, in all probability, being reached by an electric-motor elevator. At luncheon he will be able to discuss sausages, butter and bread, and at night eat ice cream and drink iced water due to the same electrical energy. He will ride all about the place in electric cars, wear shirts and collars mangled and ironed by electric motors, sport a suit of clothes sewn and a hat blocked by the same means; on holidays ride a merry-go-round propelled by an electric motor, or have his tobogan hauled up the slide with equal facility; be called to church by an electrically tapped bell, sing hymns to the accompaniment of an electrically blown organ, be buried in a coffin of electric make; and, last of all, have his name carved on his tombstone by the same subtile, mysterious, all-pervasive and indefatigable agency. This may sound like a wild and exuberant flight of fancy, but it is simply a faithful statement of the manner in which electricity is being supplied to every one of the necessities and luxuries of life in America.

A NOISELESS MOTOR.—The new Westinghouse motor, which has been in operation on the Pleasant Valley electric road in Pittsburg, Pa., is causing considerable comment from patrons of the road. They have named it the "Noiseless." One of the officers of the road says: "There is above all the wonderful ease and quietness of operation, which causes the cars to run along with a wonderful smoothness and silence. This noiselessness makes the car at once conspicuous on our line, and people are enabled to converse in an ordinary tone of voice on the car, and the residents along the line are in great praise of it. Noise has been the great objection to all motors, and we have introduced the rawhide pinions on our motors; but even then they are not nearly so noiseless as the Westinghouse motors."

GOOD HEALTH.

Remedy for Diphtheria.

The great prevalence of diphtheria at this time behooves all persons to impart whatever knowledge or experience they may possess toward relieving distress and death from this quarter. Much information of this kind is often gathered from those who are not of the medical profession—in fact a very large part of medical progress during the last hundred years has come from sources outside of practitioners. It is with this in mind that we give the following extract from an article by a recent correspondent of the *Bulletin* of this city. The remedy suggested would be perfectly harmless even when not successful:

In 1876 I was in Oakland, and an entire family of six children were down with the disease; two of them died and two others were given up and carried into an adjoining room to die, while the parents gave their entire attention to the others to try and save them, when I dropped in upon the afflicted family. They were in despair and did not know what to do. I immediately asked if they had any strong vinegar in the house, and they said yes; so I told them to bring a quart or so and a coffee-pot with a long spout. Having procured these, I got the vinegar to a boil, and then I applied the spout of the coffee-pot to the mouth of one of the children who had been given up, so that it could inhale the steam of the vinegar. The effect was instantaneous, and the child, a girl of seven years of age, grabbed the spout of the pot to prevent its removal, as she got so much relief. In about 15 minutes she began to cough, and in doing so all the diphtheria matter which clogged the throat was thrown off and the child recovered. I applied the same treatment to the others with the same results, and the parents were overjoyed when they saw their darlings saved.

I also applied the same remedy on another occasion shortly afterward while visiting a family on Turk street near Mason. The doctor had given the case up and informed the grief-stricken parents that he could do no more, for the child—a bright girl of eight years—was beyond human aid. I told them to try the vinegar remedy and they at once did so.

The next night I met the father, and he was exuberant in his profusion of thanks to me, who he said had saved the life of his only child, as she was rapidly recovering. The effect of the vinegar steam upon her, as he described it, was precisely the same as in the former cases. As it is perfectly harmless, it might be as well for parents to try it and they may have reason to rejoice thereat.

CONTAMINATED ROPES.—Every housekeeper probably has noticed how rapidly wire rope and wire have taken the place of the hemp and cotton ropes once so much in vogue. The greatest friend of the wire-rope manufacturer is the humble but terrifying *cimex*. It is not so long ago that the majority of beds were corded; nowadays they are provided with wire mattresses. Not only this, but there are wire pillows, wire bolsters, wire cushions and wire upholstery lining. The reason of the innovation lies in the fact that wire offers no breeding-ground for vermin or for diseases germs. Rope does, and is therefore feared by the housekeeper. The same change is now taking place in respect to clothes-lines. A few years since it was found that the old fashioned ropes harbored minute life, and in some instances was infested with the spores of scarlet fever, croup and smallpox. The moment the discovery was made public there was a rush for wire clothes-lines. In 1860, there was not one yard of it in use; to-day there are thousands of miles employed. Similar causes have led to the substitution of wire rope and chains for sash cords. The changes have injured the prosperity of the little insect in question, but have been a godsend to the makers of wire and its products.

DANGEROUS FLOUR SACKS.—The recent poisoning of a number of persons in a town in Maryland by eating bread was upon investigation found to be due to the fact that red oxide of mercury had been used as a paint for stenciling the brand upon the sacks which had contained the flour from which the bread was made. Flour is very absorbent, and in this case it had absorbed the poison through the interstices of the sacks.

"SUNDOWN DOCTORS."—This is the appellation said to be applied in the city of Washington to a class of practitioners who are clerks in the Government offices, and who have taken a medical degree with a view to practicing after the hours of their official work are over.

THE BOARD OF HEALTH is taking vigorous action in the matter of stamping out contagious diseases, but public opinion will support the board in any reasonable precautions for the welfare of the community, which must be placed before all individual interests.

THE great chemical trust in England has been registered as the United States Alkali Company, with a capital of $30,000,000 in $50 shares.

USEFUL INFORMATION.

Letter-Boxes.

The Postoffice Department at Washington recently called for models for a letter-box suitable to place upon either the outside or inside of dwelling-houses for the reception of letters delivered by carriers, and a commission was appointed to receive and pass upon the merits of those received in competition. That commission has met and reported that the number of models submitted to the commission was 387, the number of designs 177, the number of communications containing suggestions 200. Sixty-five exhibitors appeared personally before the commission to explain their models. There were a number of boxes which contained many meritorious points, but all were lacking in some essential requirement, and no one was accepted.

The chief value of the report lies in its suggestions for the future. The essential requirements of a satisfactory box, as outlined by the commission, are as follows:

It should be of small cost.

It should be neat in appearance.

It should protect the contents against rain, sleet, snow and dust.

It should furnish reasonable security against removal of letters by thieves, and against removal of exterior boxes from doors or walls.

It should be as simple as possible in its manner of operation.

The lid of the box should be so hung as to not require the carrier to open it, or to use more than one hand in depositing the mail.

The box should mar the door as little as possible.

The box should have an attachment of some character for the reception of papers.

It should disclose the presence of mail matter without being opened.

A NEW AND VALUABLE KIND OF BRICK.—Another utilization of waste has been announced—the manufacture of a superior quality of brick from the waste sand employed in grinding and polishing plate glass. As is well known, plate glass is ground by means of wooden plates covered with iron, between which quartz sand abundantly moistened with water is brought. By the manipulation of grinding, which consists of a constant moving to and fro of the grinding plate over the plate to be ground, the quartz sand becomes mixed with particles of iron and sand, and after it has lost its sharpness is piled up near the manufactory as worthless material. This sand contains about 15 per cent of glass particles and 2 per cent of iron particles. It is very hygroscopic, and before it can be used for the manufacture of bricks has to be dried, and is then pressed into the mold under a pressure of 660 pounds per 0.155 square inch. The pieces thus obtained are subjected to a temperature of 2732° F. At this high temperature the glass enters into a combination with the sand, a new product with new properties being thereby obtained. The bricks thus produced have a specific gravity of only 1.5; they are perfectly white and are not attacked by acids; and for this reason would be especially desirable for use in factories of chemical products, particularly in factories of sulphuric acid. They also resist frost. Regarding the strength of the material, experiments have shown them to possess a compressive strength of from 340 to 975 pounds per 0.155 square inch. By mixing the sand, enameled bricks showing beautiful colors are obtained, which may be used for decorating fronts and interiors.—*The Brickmaker.*

A NEW INVENTION IN MUSICAL INSTRUMENTS has been brought out in Austria by a manufacturer living at Pressburg, which is causing a good deal of interest. This is called a bowed piano, but is really a case resembling a pianoforte frame and containing six violins, two violas, and two violoncellos, the strings of which are tuned to different notes. The instruments are connected by circular bands, which are brought into contact with the strings by means of the keyboard, the hammers of which bear upon the bands with varying pressure. The instrument is said to produce a fine tone, soft or powerful; but the principal difficulty in bringing it into practical use would be the tuning of the gut strings required, as wire strings could not be universally employed, and it is to be feared it is only likely to be a musical curiosity.

GOLD ABSORBED BY RUBBER.—The burnt rubber used for the final polishing off of the gold lettering, etc., used in finer work in the Government Printing Office, is simply india-rubber, which has been subjected to a peculiar fire process that makes it very spongioee and absorbent. So remarkable is its latter quality that a chuck of it as big as three of a man's fingers will take up more than $15 worth gold in its pores. When, after some months of use, such a piece of burnt rubber is loaded with all the gold that it will comfortably carry, it is sent, with a lot of others in the same condition, to the Mint to be assayed.

It is reported that patents will be soon issued to cover the alloying of aluminum, which will enable that metal to be tempered and to be given a cutting edge.

NEW USE FOR DIAMONDS.—The use of diamonds as sights for firearms has recently been patented in England. The diamonds are fixed in front and back sights, and it is said enable the user to take a quick and correct aim, even in bad light. The brilliants are so fitted that as soon as the piece is brought to the shoulder the rays in the gems assist the alignment, and the eye takes aim without the least hesitation.

SHOP NOTES.

LEARN YOUR TRADE before you offer your services as a journeyman. The Boston *Journal of Commerce* gives the following hints to mechanics: How often we hear the remark made by a blacksmith, or some one who attempts to harden machine tools, that he must first understand his steel or he may fall short of making a success of it. This may be all very true and sounds quite reasonable, but it seems strange to those who have the bills to pay, who think that this "knowing your steel" should not be learned in some other way than by spoiling a piece of work that has had costly labor laid out on it. The same thing is seen in the machine shop, only it is not looked at in the same light. A shop hand frequently remarks, and with good reason, too, when he gets through with a job, that if he were to do the same work over again he could save money by it, or that he has just got the knack of turning off the work easily, and making a saving in time, and still no one has a right to say that this feature should have been a part of his trade long before he came to work and not to have picked it up at the company's expense, for a trade is a growth with lots to learn and little to forget every day. The contractor can take the same thing right home to himself, if he likes; that is, if he has a mind to look at it in that way, for how many times has he found himself in just the condition, when about to complete a contract, that he should have been in when he commenced. Every scheme and method seemed to have proved a failure until along at the close of the undertaking, and then, just as everything gets settled down to good working buss, the contract is finished.

CLEANING MACHINERY.—The simplest and most efficacious method of thoroughly cleaning the various parts of machinery that have become gummed and dirty by the use of fat oils for lubricating purposes is by using a strong soda lye. For each 1000 parts by weight of water, take about 10 or 15 parts by weight of caustic soda or 100 parts ordinary soda. Let the solution boil and enter the parts to be cleaned; either boil them in this lye or let them steep in it for some time. All the dirt and oil resin is completely dissolved thereby, and it remains only to rinse and dry the parts. The action of the lye is such that it enters into combination with the oil and forms soap, which is readily soluble in water. In order to prevent the hardening of the lubricant on the machinery parts, it is only necessary to add about one-third kerosene. An occasional lubricating with kerosene alone is to be recommended.—*American Engineer.*

GOOD WORK in any trade depends on good measuring, but the workman who measures too much is about as unreliable as the man who talks too much. Fine measures in rough work are frequently as much out of place as rough measures in fine work. A useful faculty, and one that every mechanic ought to cultivate, is that of measuring or estimating sizes by the eye. In drilling holes for rough bolts, visual measurement is good enough, if done by an expert, while it frequently happens that a slovenly workman will drill holes much larger than the drill without knowing it, or the reason why, and the former will measure closer by the eye than the latter with rule and calipers. The faculty is acquired and kept up by constant practice, by the aid of a standard of comparison such as a common rule.—*Ex.*

HEATED BEARINGS may arise from a variety of causes, such as (1) Bearings of insufficient area for the pressure or strain put on them. (2) Machines run at short centers with a tight belt. (3) Bad fitting bearing or seamy shaft. (4) Bearings too good a fit or screwed up too tight. (5) Insufficient lubrication, improper or bad oil. (6) Dust or dirt in the bearings, oil grooves too shallow, or oil-ways stopped. (7) Bearings will also stretch and pinch the shaft from being allowed to run slack or get out of line of level. (8) From oil-boxes or lubricators being or becoming air-tight and preventing the proper flow of oil. (9) From the axles of all the journals not being parallel, or from the spindle not bedding surely on the bottom of the bearings. (10) From spindle or pin being sprung or bent.

A SHOP POSTOFFICE.—We saw recently a system used in a large engine and boiler establishment for promoting detail work around the shop which seems worthy of adoption in large railway shops. At the desk of each foreman was a tin box, in which all communications for other departments were put. A messenger was detailed whose duty it was to keep moving from shop to shop, picking up and leaving mail in each of these boxes as he went through, completing the rounds generally within an hour. The result was that many questions were answered inside of that time, thus saving a great deal of time of the foremen and obviating the necessity of their leaving their own particular shop. The results are said to be most gratifying.—*Master Mechanic.*

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Business Announcements.

[NEW THIS ISSUE.]

Improved Ore Concentrator—James Tullock, Angels, Cal.
Assessment Notice—Leigh Gravel Mining Co.
Dividend Notice—Pacific Borax, Salt & Soda Co.
Machinery for Sale—I. A. Heald.
☞ *See Advertising Columns.*

Passing Events.

On Tuesday night last the drought that with scarcely any interruption had run for a period of seven months was terminated by a copious rainfall, followed by another equally abundant on Wednesday night. As these rains have extended over the whole State, our fears of a dry winter are measurably relieved.

Five new States, North Dakota, South Dakota, Montana, Idaho and Washington, having lately been admitted to the Union, Secretary Tracy has just issued an order increasing the number of stars on the national ensign to 43, corresponding with the 43 States of the Union. Wyoming having still more recently become a State, another star will now require to be added to the number.

Parnell still maintains his place at the head of his party, though it is thought he may ultimately consent to be temporarily retired.

Congress convened on the 1st inst. Promptly the fight on the Election law was resumed in the Senate. The President's message, which as usual was at once set in, is, as a matter of course, approved by one party and condemned by the other.

Owing to the rate the seals have been destroyed during the past few years, threatening their early extermination, there is a chance that England and the United States will come to an arrangement whereby none of these creatures will be killed next year.

On the 3d inst. Cyrne W. Field and his wife of New York celebrated their golden wedding, having been married 50 years.

No outbreak among the Indians is likely to occur, certainly not before the advent of warmer weather, the recent cold snap having chilled the ardor of the "braves" for a fight. There is danger, too, of the "grub" question becoming stringent should they leave the reservations. The Messiah continues to draw his regular rations much after the fashion of the other "Redskins."

A Business that Helps Every Other but Antagonizes None.

Mining for the precious metals, more especially for gold, has its drawbacks and troubles. Like every other pursuit, it is beset with many difficulties and is sometimes attended with disappointment and loss. But there is a class of evils incident to most other kinds of business from which this is wholly exempt. The gold miner has for the product of his mine always a market; not only so, but it markets itself. He does not have to seek a purchaser, nor does he have to employ an agent, assistant or broker. So far as price is concerned, he always deals with first hands. He never has to sell at a discount or allow any commissions; no matter where it is produced or in what form it is placed on the market, whether in the shape of coin, dust or ingots, gold is always at par. The great bars from the Treadwell mill in Arctic Alaska, and the quill-preserved dust gathered by the black woman in far Ethiopia, are worth, ounce for ounce, just the same. The savage and the civilized man alike have an instinctive appreciation of the value of gold, it being the one thing that can be bought and sold without a middleman or an interpreter.

Again, the market for this metal is never overstocked. There is never any glut, produce what we may. The supply never exceeds the demand. As has been aptly observed, "There is ever a dearth of gold." The consumer is a negative factor and need not be consulted. It can safely be assumed that he is ever suffering from a shortage. There may occur a plethora of most other things, but not of this. The oatchers and canners of salmon may take and put up more of these fish than the world cares to eat. The farmers may raise so much wheat that there cannot be found for this cereal a profitable market, and so of innumerable other commodities, but never can there occur a plethora of the most royal metal, the spot and the mart price of which differs not greatly—the value of gold in the city of London and on the West Coast of Africa being nearly the same.

Another pleasant feature about this business of gold mining is the fact that it does not injuriously compete with any other interest, pursuit or calling. It is helpful to all but hurtful to none. This can be said of hardly any other industry or calling. The party who starts another factory, store, cobbler's stall or peanut stand does so to the detriment of some one else; not so the gold miner. He may put up a mill beside that of his neighbor and even on the same ledge, yet no one feels aggrieved because no one is hurt. As gold is the universal medium of exchange and measure of value, so is it the metal of universal good-will.

Generally Hold Their Claims Too High.

The Grass Valley *Union* comments with some severity on the practice, so common among claim-holders, of asking excessive prices for their mines, or rather mineral locations, remarking that such course not only deters capitalists from investing in properties of this kind, but tends to discourage them from even so much as coming or sending agents to look at them, the *Union* advising miners to moderate their demands if they hope to effect sales hereafter.

This is good advice, and claim-owners would everywhere do well to pay attention to it. Comparatively little foreign capital is coming to California just now, nor is much money being put into our mines by home investors. It is the case, too, that parties willing to embark their means in mining are more cautious as well as more exacting in their requirements now than formerly. They will not so much as look at a property of questionable value, nor will they pay extravagant prices for good ones. The field is too large, and there are too many mines on the market for that.

The agents of Eastern and other outside capitalists have to traverse a great extent of mineral-bearing territory before they reach California. Keeping off to the north, they may, without going much out of their way, take in the great metalliferous States of Dakota, Montana, Idaho, Washington and Oregon, or deflecting their course a little to the south, they may pass through Colorado, New Mexico and Arizona, all rich in the precious metals and all swarming with prospectors and miners anxious to sell their claims, willing often to accept almost any price that may be offered for them; some of these countries, in their greater nearness to the Atlantic seaboard and the principal money marts and supply centers, possessing a decided advantage over California.

Then, besides these our neighbors, there are other countries competing with California for capital. Mexico, Central and South America, Africa, India and Australia are all in want of money—all want to sell their mines or obtain means to open, outfit and work them, and are bidding high for it. Labor and capital in most of these countries are cheap—much cheaper than here, the only advantages California possesses over them being her better climate, better machinery, and perhaps also better mines. But these will not avail to secure us purchasers unless we can offer our mines at reasonable figures as compared with those that elsewhere obtain. These are facts that should be borne in mind by such of our claim-holders as wish to dispose of their properties, and cause them to moderate their ideas as regards prices.

Planned for the Home of a Great People.

If ever Nature plans with a purpose of the kind, it was clearly her design that California should become the home of a great nation. Look at her and study her advantages and possibilities in all their aspects and bearings; consider her incomparable climate, her prolific soil, the motive-power of her many rivers and her wealth of forests and mines. Translate these into the language of industry and commerce, and what do they teach? Clearly that California was destined to be the seat of wealth and power—the home of a numerous, rich and prosperous people.

While the Pacific ocean on the west will forever serve as a cheap highway to countries abroad, her great bays and far inland-reaching rivers will remain the channels of domestic trade and traffic. Starting at the seashore and traveling east, we pass over a succession of low mountains and fertile valleys till the foothill region of the Sierra is reached, with the great forest-clad, snow-crowned cordillera beyond. Issuing from these mountains more than 20 large rivers, besides numerous smaller streams, flow west, affording ample means for irrigation and water-power of almost illimitable extent. That the flow of these rivers might not fail when most required for irrigation, Nature took the precaution to pile up every winter enough snow about their sources to keep them well replenished till this need is no longer stringent. Through this wise provision the propulsive power generated by these streams never wholly fails, nor is it ever more than partially abated. As the fall in these rivers varies from 5000 to 10,000 feet, their value for propulsive purposes can hardly be overestimated.

The lack of a good coal has ever been considered an insurmountable obstacle to the establishment of large and successful manufacturing industries in California. But with the immense water-power afforded by so many mountain streams, this difficulty is in large measure overcome, the practicability of transmitting this power to distant points through the electric cable adding largely to its value. Besides the propulsive power derived from this source, both wind and wave power can in this State be made largely available for driving machinery, and that they will in good time be so employed admits of no doubt. What will greatly aid manufacturing in this State is the extent to which we produce the raw material in almost every required form. In this respect no country in the world is richer than California.

But a good country is but half of a great nation, and the poorer half at that. It is their character rather than their possessions that makes a people truly great. And who can tell us what manner of man is this who is coming to inhabit California? We have here assumed that he would be worthy the country he is to occupy; but about this opinions differ. The best countries do not always produce the best races of men, and possibly California may not prove an exception. Our predecessors here were not much to boast of, nor have we as yet made ourselves conspicuous by our intelligence or our virtues. Occupying the best country in the world, we have shown ourselves neither better nor worse than the average of mankind.

The President's Message.

Congress convened on Monday, when the President's message was read and heralded through the press to all parts of the United States. For a short session the message is much longer than the average, but this can be overlooked when it is considered that he must devote considerable space to the important subjects under debate at the last Congressional election.

Taken as a whole, the message contains much to commend; but like all annual messages to Congress it contains weak points open to attacks from the opposition, but it is this divergence of opinion that makes a politician's life endurable, and which is also calculated to keep each party on the alert for the best interest of the country.

The most interesting features in the message can be briefly stated as follows: Approving reference is made to the Pan-American conference, which marks an epoch in the history of the Western Hemisphere. The President surprised (probably agreeably so, too,) the country by disavowing the action of Mizner, Minister to Guatemala, in the Barrundia case, and the Minister has been recalled. In briefly referring to China, he states that he has made a proposition to the Governments of Mexico and Great Britain to consider a conventional regulation of the passage of Chinese laborers across our southern and northern boundaries. On the silver question he fails to recommend free coinage, but says that "it having been thought best to renew formally the suggestion of an international conference looking to an agreement touching the full use of silver for coinage at a uniform ratio, care has been taken to observe closely any change in the situation abroad, and no favorable opportunity will be lost to promote a result which it is confidently believed would confer very large benefits upon the commerce of the world. The recent monetary disturbances in England are not unlikely to suggest a re-examination of opinions upon this subject."

The receipts of the Government for the fiscal year are given at $163,963,080.85, and the expenditures at $358,618,584.52. The recommendation of the Attorney-General that greater care be taken in the examination of applicants for citizenship is indorsed, as is the recommendation that pool-selling in the District of Columbia be prohibited. The Behring-sea difficulties have not been adjusted. The Pension Disability Act has not entailed a greater outlay than was expected. The beet-sugar industry is declared to have passed the stages of experiment and may be regarded as a complete success.

The President predicts that recent legislation will quicken and enlarge the manufacturing interests, increase markets for farm products and cause general prosperity, and he shows that there has been a general improvement in trade and industry during the year; that the number and extent of business failures have decreased; that business, as shown by Clearing-house returns, has increased; that prices of agricultural products have advanced to a marked extent, and that labor troubles have diminished.

The President discusses at some length the McKinley tariff, and deprecates the idea of subjecting the Act to important changes until it has been fairly tried. Reciprocity receives a large share of favorable attention.

The President's reference to the water question possesses peculiar interest to this coast. He says that "the owner of the water is the owner of the lands, however the titles may run,

All nnappropriated water sources and all necessary reservoirs should be held by the Government for eqnal nse at fair rates." He snggests that the Government should take charge of the watersheds.

The message ends with recommendations to Congress for tha passage of apportionment and appropriation bills. For the encouragement of American steamship lines connecting domestic and foreign ports, an especial plea is made for tha Oceanic Steamship Company of San Francisco, whose steamers ply between San Francisco and Australia, and which may he driven nut of the business nnless the United States comes to the rescne. The President calls attention to tha danger of a rival subsidized line from British Colnmbia.

For the incorporation of an international American bank to fecilitate business with the other American nations.

For an increase in the salaries of United States Judges to $5000 a year.

For the settlement of Mexican and Spanish land grants.

For the passage of a national hankrnpt law.

For an international copyright law.

For the passage of a law compelling railroads to nse couplers and brakes on freight trains.

For the passage of lawe reserving all water rights and reservoir sites in the arid regions for public nse.

For the passage of laws to enable the Post-office department to contract with the telegraph oompanies to eetshlish a postal telegraph system.

Fnr the passage of lawa for preserving the purity of the election, and a speoial reoommendntion for the passege of a hill similar to that known as the "Force" hill during the last session of Congress.

List of U. S. Patents for Paoific Coast Inventors.

Rsportsd by Dawey & Co., Pionsar Patent Solicitors for Pacific Coast.

FOR WEEK ENDING NOV. 25, 1890.

441,533. — STOP-BLOCK FOR WAGONS—J. W. Carter, Tacoma, Wash.

441,145.—VISE PIPE-TONGS—John Ellis, Stockton, Cal.

441,154.—HARROW—J. T. Grant, San Jose, Cal.

441,414.—WHEEL CULTIVATOR — D. F. Hunt, Elherton, Wash.

441,419.—FERMENTING-TANK WINE-STRAINER —J. C. Jones, Napa, Cal.

441,584.—PROTECTING PILES—F. Rives, Seattle, Wasb.

441,334.—SPEED INDICATOR — F. N. Scofield, Phœoix, A. T.

441,382.—CULTIVATOR — Robert Simpson, Hanford, Cal.

441,598.—SUSPENSION BRIDGE—G. W. & F. P. Stedman, S. F.

441,449. — WAVE-POWER MOTOR—E. D. Stodder, S. F.

20,350.—DESIGN—E. Shepperd, S. F.

The following brief llet by telegraph, for Dec. 2, will appear more complete on recsipt of mail advices:

California — Albert J. Armetrong, Coronado, boot calk; Hane C. Bebr, San Francieco, cruehing roll; George H. Clark, Sacramento, burial apparatue; Greenwood Fry, Cottagsville, Ky., assignor of one-half to H. M. Crawford, Los Angeles, corn-planter; Lamartine E. Fulda, assignor of one-half to E. Fulda, San Francieco, hoop coupling; Wendell P. Hammon, Oakland, and C. J. Sechrist, San Francisco, fruit-drying tray; Herbert S. Herrick, San Francisco, dose-measuring bottle; Andrew McClain, San Diego, fumigator; Samuel A. Owen, West Berkeley, propulelon of vessels; James Patteroon, Stookton, and W. Patteroon, Benicia, steam boiler; Florian Stanke, San Francisco, fruit-gatherer; William S. Van Sant and E. E. Eamee, Dixon, coin actuated liquid-vending machine.

NOTE.—Copiee of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the ehortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

EXERCISING DEVICE FOR MUSICIANS.—Eugene S. Bonelli, S. F. No. 440,837. Dated Nov. 18, 1890. This device is for exercising the muscles of the fingers, hand and wrist, and belongs to that class in which a pivoted spring-controlled lever having a finger-strap, to receive one finger, is used in connection with a bridge on which the other fingers rest. The object of the invention is to provide a readily portable machine capable of exercising all the muscles necessarily used by musicians. Its novelty consists in various details of construction, as, for example, in the changeable springs by which the lever is affected from above or below the finger loops, the adjustability of the bridge above or below the lever, the wrist attachment and other features.

COMPOSITION FOR PROTECTING PILES.—James Rowe, S. F. No. 440,832. Dated Nov. 18, 1890. This composition belongs to that class of pile protectors which consists of suitable compositions of matter applied to the exterior of the pile and forming a coating therefor which is intended to resist not only the action of the water, but especially the ravages of marine insects, particularly the teredo. It consists of an inner covering and an outer coating. The inner covering is made up of such ingredients as tar, asphalt, etc., together with a resistant and a poison. The outer coating is one which will harden and set to protect the inner covering.

CULTIVATOR.—Robert Simpson, Hanford, Cal. No. 441,382. Dated Nov. 25, 1890. The novelty in this cultivator consists in connection with a wheel shaft and suspended toothed-frame of rigid pole and guides and supports for holding the frame in place, and preventing it from swinging from side to side, and for raising and depressing it. The cultivator is prevented from swaying outside the line of the wheels, and it can be easily guided to avoid a root or tree. It may be raised to avoid anything and can be held at any desired depth in the ground. The draft is brought directly upon the pole, and the axle is relieved from this strain.

FERMENTING-TANK WINE-STRAINER.—John C. Jones, Napa, Cal. No. 441,419. Dated Nov. 25, 1890. This device is to be used in connection with the discharge of wine from the tanks in which it is fermented. It consists of a removable strainer and means for clearing it while in position. Within the tank are vertical channeled guides on each side of the discharge opening and extending to the top of the tank; in these guides is fitted a vertically movable box, and upon the interior of the box are adjustable rods forming a screen; a transverse bar travels upon the outer rods as guides, said bar having tongues which project between the intermediate rods, and a rod is arranged to reciprocate the transverse bar.

The Gold Belt of California.

NUMBER IV.

Tha Anciant Placers and Their Relation to Wall Rocks.

[Written for the MINING AND SCIENTIFIC PRESS by STEPHEN BARTON, Kernville, Cal.]

The occurrence of these heavy nuggets of gold in snch close proximity, while no such nnggets were fonnd elsewhere in that section, together with the oconrrence of nuggets of equal size in the original matrix in the same belt and formation, is sufficient proof that they were born olose at hand. To the east the mountains stood high above the ancient channel, and explorations failed to locate a vainable mine there, from whioh these nuggets oonld have been carried. To the northeast the lime belt curves up the South Fork of Stanislaus and appears still farther east on the north hinff of the North Fork of that streem. The region between the forks of this stream has been neglected for want of water, and still it was over this region that the ancient gravel passed which covered the region around Colnmbia. For a nnmber of miles the track of this current was over alternations of lime and soft slate, with an occasional showing of coarae porphyry and greenstone. If these nuggets did not pass over the region between the forks of the Stanislaus, then they came from lodes sitnated at the head of Three Pine Gulch. Until very recently there wes no disposition to look for a quartz lode in that locality, and still the cnrrents whioh once swept over there deposited millions of dollars along their track. I will allow that this ancient cnrrent was of great force and volume. On the sonth of Gold Hill, west of Colnmbia, ie a block of quartz five feet in diameter reposing on a lime formation, and brought there hy the current which deposited the gravel of the ancient placers. Bnt admitting the force of the current, no reason can be assigned why still heavier matter shonld not have lodged farther up the stream, and hence we conclude that these large nuggets remained near the original matrix. If they were all carried acroes the region now occnpied by the gorge of the Stanislaus, then many of them should have been left to be carried down alcng the hed of that stream. On the other hand, the coarse gold of the Stanislaus was mainly limited to the Pine Log Bar, and almost certainly came into the streem there from the sonth. Pine Log is 1300 feet below the level of Columbia, and if this gold was born of the contact between intervening formations of lime and elate, there must be a mint of it left; but if it wae erupted there, then the chance for drainage would offer an opportunity to etrike the main hody nearer Pluto'e dominione.

During the last summer, ae agent of mining etatistics for the 11th cenens, I had frequent occasion to notice the tranaitory nature of quartz lodee in granite. Some minee I noticed where a film of gold and a thin sheet of kaolin olay eerved ae an excuse for a lode. In many cases the width of the lode varied from a half-inch to six inohes, All theee lodee are shallow and richest near the surface. The Joe Walker mine at Walker'e Basin, Kern county, offers one inetance which hae come under my obeervation where rich rock was followed down between granite walle to a depth of 290 feet, hut the couree of thie lode is diagonally toward the contact of elete and lime to the northeaet and but a ehort distanoe away. Most of the Havilah minee are eimilarly located, except that the main lode, of which most of the others are epure in the westward, ie looated parallel to and in oloee proximity to the lime contact farther east. While thie latter lode carries moet of the gold of that district, it hae not been worked because it ie not free-milling ore; that ie to say, that the gold ie eo intricately combined with other metale and eubstances that it paeeee the skill of the ordinary miner to eeparate it. The miner and the capitaliet will condemn euch ore as worthless and paes it by; hut to the eclentiet it presents the question of its recondite history. After five minutes devoted to figuree he diecovere that this oharacter of formation contains more than a molety of the preoious metale of the State; that with them are oombined nearly all the useful metals, nearly all the refractory oree. The dawn of theee truthe upon his imagination awakens a new interest in these vast ore depoeits, and hie thought ie ae to how to extract the preolous metale without destroying the useful onee.

There are aeveral streams in California whioh have not yielded placer gold. On the heade of theee streams the metal-hearing lodes contain gold in such oloss chemical combination with lead, zinc, antimony, tellurium, selenium, vanadium and many other snbstances, that it requires a careful assay to determina its presence. This fact explains why no gold was dng in cartain districts on the western slope of the Sierra Nevada mountains. It has also dona much to obscure the true geology of gold. It has no nobler linsage then the other matals. It was born of the same causes; and if we reckon the refractory ores, the great hulk of it is combined in the seme matrix. In some instances and in certain localities, oxygen has carried away its associatee, and has left the pure metal for scientists to ascribe a volcanic origin to. On a line running to the east of south from Mono lake, through the heart of the Sierra Nevada mountains, crossing the heads of the San Joaquin, Kings river, the Kaweah, and thence down Kern river and to the Mohave desert, there is a formation which is indeed rich in its refractory ores. I am not aware that any of the ancient channels covered any of this region, hut from the summit of the Sierrae I see a white mountain to the east of Tehachipi and to the north of Mohave, which closely resembles the lava-capped hills minus the lava; and I am told it is composed of porcelain cley. I am strongly inclined to the opinion that it covers an ancient gravel deposit, and shell try to satisfy myself on that point some day. This line of refractory ores has a great similarity throughout, and will afford food for the reflection of the meteilnrgiet of coming generatione.

(To be Continued.)

Why the Rains Were Late.

The Signal Service weather report for November has just been issued. In it Lieutenant Finley of the Signal Corps, in charge of the Division of the Pacific, says:

"The most remarkable feature of the weather for tho month ie the extraordinary deficiency of rainfall. It ie a deficiency which affects the entire Pacific Coast from Mexico to British Colnmbia. The proximate oause for this deficiency is found in the high latitnde of the easterly movement of cyclonic areas from the Pacific ocean. In spite of the fact thet there were a large number of these arees, only one of them passed south of the northern bonndery of the United States. This area gave rise to a peculiar secondary cyclonic effect which passed sonthward into Nevada and gave rise to the sndden and rather heavy rains in Western Arizona and Southern Californie. This secondary area was forced southward by the rapid formation of a high berometer in Washington and Oregon. A weather record for San Francisco, embracing a period of 42 years, shows that never before within that time has the month of November been so deficient in rainfall. The emallest amounte previously recorded are 0.15 of an inoh in 1862; 0.25 in 1876, and 0.26 in 1884.

"A chart with the storm track for November, 1884, shows hut three cyclonic areas, two of which passed eastward north of Washington and the third through the northern portion of that State. This slight deflection to the sonthward of one of those areas was sufficient to give California a few light showere. The cyclonic areas for November, 1890, have been peculiar not only for their high latitude but also for their rapidity of movement, which has tended to increaee their nnmber, which is unusually large for the month. This rapidity of movement aleo explaine the large number of deye on which light showere fell in Washington and Oregon (nearly two-thirde of the month) and the small total of precipitation. The conditione for rainfall were no sooner formed than a change in the cyclonic oirculation drove them away. It is not within the province of thie review to discuss the qnestion as to the cense of the extreme northerly movement of the cyclonic areae for this month.

"Rainfall—It is everywhere deficient, and the amonnt of each deficiency varies from .06 of an inch at Keeler to 6.15 inches at Olympia. The deficiency increasee in amount from south to north, and is especially remarkable north of the 38th perellel. Rain fell on the following dates: Washington—5th to 11th, 13th, 14th, 17th, 18th, 22d to 24th, 26th to 28th. Oregon —5th to 8th, 11th, 22d to 27th. California—5th to 7th, 22d to 25th. Nevada—6th, 9th. Arizona—6th to 8th. The heaviest rainfalls in 24 hours were .66 of an inch at Fort Canby on the 8th and .56 of an inch at San Diego on the 7th. A fall of 2.65 inchee was reported from Globe, A. T., on the 8th. The heaviest monthly rainfalle were .70 of an inch at San Diego and Olympia. The following stations report no rainfall: Walla Walla, Winnemncca, Red Bluff, Sacramento and San Francisco. Snow ie reported as followe: Washington (6th), Whitman county. Oregon (6th), Herney county. California (5th), Pinmas, Ynba and Sierra countiee, 2 to 24 inohes; (6th), Ventnra county. Nevada (6th, 9th). Arizona (8th), on Pinal mountains.

"Local etorme—Hailstorm at Beiotta, Cal., 8th; thunder-etorm at Quincy, Cal., 5th. High 'northere' occurred in California on the 11th and 12th during the prevalence of an area of extremely high barometer in Northern Nevada, Idaho and Oregon. The barometer during thie time wae from .40 to .60 of an inoh above the normal. In eome placee the wind wae reported ae reaching a velocity of over 60 miles per honr, causing damage to fencee, trees and roofe of buildinge. Floode were reported from Western Arizona on the 8th, causing high water in the Gila and Colorado rivers.

"Temperature—it has been above the normal in all districts. The excess ranges from 3 degrees at Olympia to 12 degrees at Los Angeles. The highest temperatnre, 96 degrees, occnrrad at Los Angeles on the 3d; the lowest, 10 degrees, occurred at Winnemucca on the 13th."

An Address on the Weather.

Lieutenant John P. Finley gave a detailed explanation of "Cyolonio Development and Preoipitation upon the Pacific Coast" before the Academy of Sciences Monday evening.

"In a mountainous country," said he, "weather conditione are localized. North of the 30th parallel we look to the west for the coming of storms. All storms which enter this country come from the Alentian islands, or the region adjacent to Japan, the great breeding-ground of storms.

"The precipitation depends upon the parallel along which the storm moves. The rainfall dnring October, 1889, was the greatest for that month in this city dnring a period of 42 years, and the reeson for it was the lower easterly movement of the storm. As a rule, storms strike Alaska on the Washington coast first, bnt in this instance they struck the northern part of California directly. This may have been due to an area of high barometer to the north, which caused the storm to deflect more to the south than usual.

"This year for the first time in 42 years no precipitation has been recorded in San Francisco dnring November, hnt the signal charts ehow that there hae been no lack of cyolonic movement, as 10 etorms were recorded during the month. They, however, all passed along unnaturally high latitndee. They moved very rapidly, and there was no time for a storm to grow to the sonth.

"The summer storms in Southern Nevada, Western Arizona and Southwestern California were due to the melting of the huge masses of snow in the mountains, which encharged the air with moisture at the same time that a cold wave passed along the eastern slope of the Sierra and condensed the clonds into rain.

"All cyolonic movements are divided into qnadrants. The southeast qnadrant is nearest the food snpply, that is, the moisture, and hence it is from thie section that rain comes. The northeast qnedrant develops the greatest cloudiness, with some rainfall. The northwest qnadrant is the coldeet and driest, while the sonthwest qnadrant, on its western side, partakes of the nature of the northwest qnedrant and on its southern side of the sontheastern one.

"With signal stations on the Alaskan ocast and the Aleutian islands and telegraphic communication, we should he enabled to forewarn every storm and approximate its course.

"It is not alone the Pacific Coast that is influenced by the cyclonic movement from the west. The storm, shorn of its moisture, it may he, keeps on eastward, when it again becomes surcharged with moisture, which is precipitated in the great interior valley and on the Atlantic seahoard. Its breeding-gronnd then becomes the Gulf of Mexico, and the air currente generated hy it produce the hurricenes and destructive tornadoes in the region east of the Rocky mountains.

"The theory of cycles seems more a theory than a fact. I have experimented with the etetistics for many years, and I find that you can place no dependence in a recurrence of wet and dry eeasone at regular intervals."

TIMBER FORESTS GOING FAST.—The rate at which the timber foreste of .thie ocuntry are becoming exhensted is eomething that people in general have no proper idea of, saye the *Ohio Valley Manufacturer*, and it ie evident that if a subetitute for timber for furnitnre and buildinge ie not prodnced, there will eoon be serione consequencee. From a recent authentic statement it appears that the amount of timber converted into lumber in Michigan, Wisconsin and Minnesota lest year reached the enormone aggregate of 8,305,833,277 euperficial feet, exclusive of white pine ehinglee, which, if added, would bring the total conenmption up to 9,000,000,000 feet. It is asserted ae a matter of fact that the timber lande of the Northwest are practically exhanated. Of 20,000,000,000 feet reported hy the censue of 1880 ae then etanding in Lower Michigan, only one-tenth now remaine, and in the three States there is eetimated to he lees than 10,000,000,000 feet.

A GREAT COUNTRY AND ITS INSTITUTIONS.—Wonderful during the paet few yeers has been the progrese of the Great Northwest, thie expansion and growth having been more aptly exemplified in the history of Washington than in any other eection of that vaet region. That State is full of establishments and inetitutions such ae we look for only in old and long-settled countriee. Among inetitutions of thie kind ie that known ae Everette'e Mining Office in Tacoma, whereat the sampling and aesaying of ores and eimilar work is done in a manner not eleewhere enrpassed. At this piece full and reliable information about the mines, oree and mineral deposite of the whole Northwest oan also be obteined. For further information in regard to thie model establishment, see advertieement in another column of thie paper.

THE regnlar quarterly meeting of the members of the Mechanics' Institute will be held at the Library, 31 Poet street, on Saturday evening, Dec. 6, 1890, at 8 o'clock.

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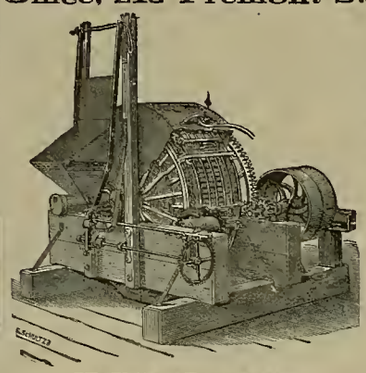

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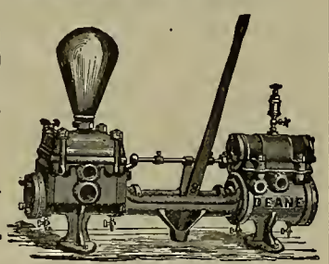

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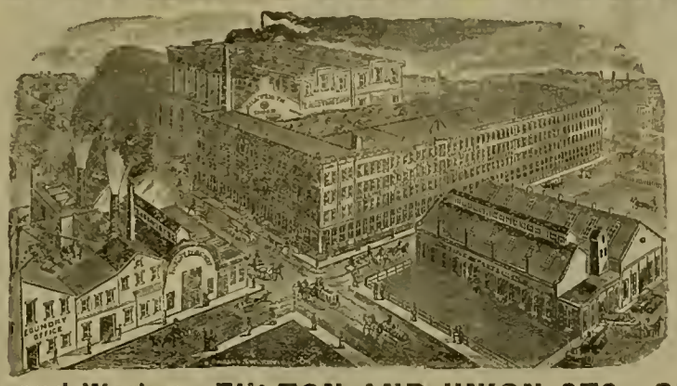

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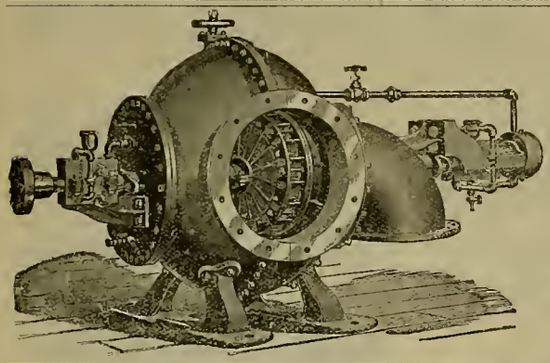

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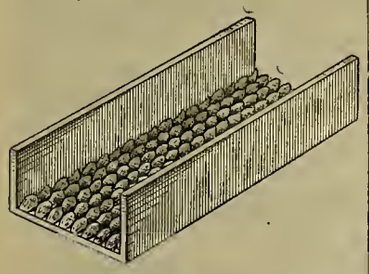

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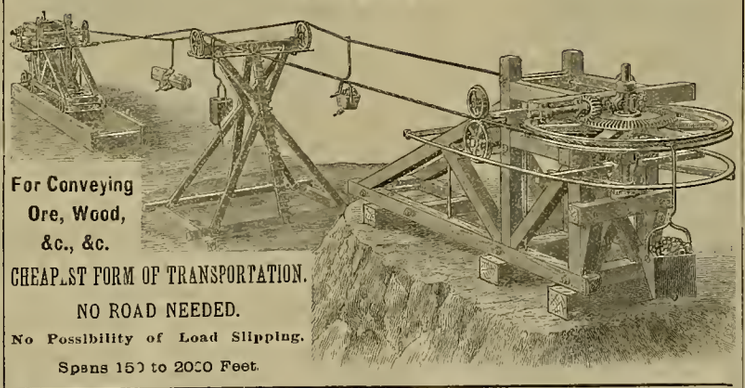

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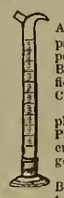

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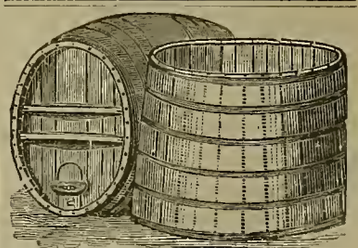

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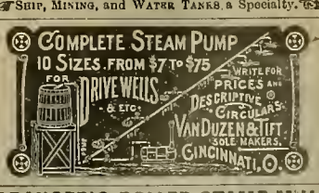
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258 Market St., N. E. cor. Front (up stairs), San Francisco

Experimental machinery and all kinds of models Tin and brasswork. All communications *strictly confidential.*

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 4, 1890.

General trade the past week was quiet, but not more so than obtains at this season of the year. Rains the past week have imparted a more cheerful spirit to trade, for they insure more active outdoor work on the farms and also inspire the belief that without some unforeseen event the crops, particularly that of wheat, next year will be among the largest on record. Heavy snowfalls on the mountain ranges assure a bountiful supply of water next year for mining purposes. The foundation is well laid for a very prosperous year in 1891.

The local money market is easier than it was in December, 1889, and this, too, in the face of so much money sent East last month. Now that this money is being returned, still greater ease in the money market is looked for. The large sums to be paid for taxes, in dividends and for interest have been engaged, so that the stringency from these sources is discounted. Those in position to know, unhesitatingly affirm that we will have an easier money market the forepart of 1891 than ever before known.

MEXICAN DOLLARS—The market the past week was quiet but firm. The demand for China is not as large as in former seasons; one cause of this is the more favorable position for remitters of the exchange market. Quotations of Mexican dollars range from 82½@83cts.

SILVER—Offerings, purchases and prices paid so far this month are as follows:

Date.	Offered ounces.	Purchased ounces.	Price paid per ounce.
December 1....	891,000	506,000	$1.0675 to $ 1 075
December 3....	.....	321,000	1.0545 to 1.0595

No sooner did Congress convene on last Monday than several free-coinage bills were brought out. So far as we can judge from the brief telegraphic reports of the bills, that of Senator Plumb commends itself as the best adapted to the requirements of the country. Yesterday a bill was introduced in the House by Taylor of Illinois requiring the Treasury to purchase the 13,000,000 ounces of foreign silver in this country, after which confine all purchases to domestic silver. The action of the Senate in springing political issues or bills (the election-force bills and similar measures) creates uneasiness among silver advocates that the time will be frittered away until it will be too late to pass a silver bill or any other bill looking to the relief of the country. In this city considerable silver is said to have been sold this week at prices ranging from $1.07 an ounce at the opening down to $1.06 at the close.

In this city the Mint's counter rate was on Tuesday, $1.07 an ounce, on Wednesday, $1.06, and today, $1.05¾.

QUICKSILVER—Receipts the past week aggregate 484 flasks. The market is easy at unchanged quotations. Heavy snowfalls the past week in the mountain ranges assure an active mining season next year, and consequently a liberal demand for quicksilver.

LIME—Receipts the past week aggregate 4578 bbls. The demand continues free at current quotations.

LEAD—The market is a shade weaker in sympathy with lower prices at the East. Close money markets at the East and the closing month of the year are against sellers.

TIN—The market continues dull. So far as we can learn, holders are firm in their views for plate. New York and English advices report the market easier for pig, with concessions obtainable.

COPPER—English advices report a fluctuating market, caused more by the money market than from any other cause. The visible supply continues to decrease. New York advices report that outside parcels of copper are obtainable at less than quoted rates, but the Lake companies are firm at 17. It looks as if after the turn of the year the market at the East will do better.

IRON—The market is essentially unchanged.

COAL—Imports the past week aggregate as follows: Seattle, 7848 tons; Departure Bay, 800; Coos Bay, 1800; Newcastle, 3054; Nanaimo, 2390; Comox, 4200. Total, 20,292 tons. The market appears to have an easier tone. The price of Coos Bay is reduced $2 a ton. The imports in this month of coast coals are expected to be quite large. The tonnage on the way to and loading for this port is as follows: Newcastle, N. S. W., 46,048; Sydney, 5565. There are large quantities of coal on the way from English ports. Rains the past two days have caused a freer consumption, which if followed by cold weather will enlarge the consumption still more. If this does happen, prices, it is said, will not be any lower this year.

Eastern Metal Markets.

By Telegraph.

NEW YORK, December 3.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday.....	.....	.....	.....	.....	.....
Friday.....	48¾	1 05	$15 50	$4 80	$20 35
Saturday....	48¾	1 06	16 50	4 80	20 80
Monday.....	48¾	1 06¾	16 50	4 70	20 70
Tuesday.....	48½	1 00	16 50	4 57½	20 65
Wednesday....		1 05½	16 50	4 60	20 60

NEW YORK, December 2.—Quicksilver is no better, 75@ 76c Copper still neglected, 18@15½c. Recent quotations for lake do not cover much volume of business, being held at 17c. Under grade, quiet; Arizona, 14¾@15½c; casting, 14@14½c. Pig Lead, light demand. Spot, $4.75; future, $4.60@4.65.

Coal and Coke.

SPOT FROM YARD—PER TON.		TO LOAD—PER TON.	
Wellington	$14 00	Australian	$ 8 75@— —
Greta	14 00	Liverpool St'm.	8 50@— —
Carbon Hill	9 00	Scotch Splint..	8 50@ 9 00
Nanaimo	11 00	Cardiff	8 50@— —
Gilman	11 00	Lehigh Lump..	15 50@17 00
Seattle	11 00	Cumberland lik	13 50@— —
Coos Bay	9 00	Egg, hard	15 00@— —
Cannel	16 00	COKE—ENGLISH.	
Egg, hard	16 00	To load	$12 00@13 00
Cumberland, in sacks	19 50	Spot, in bulk..	16 00@18 00
do. bulk	18 00	All spot quotations subject to change without notice.	
Wallsend	13 00@14 00		

The Mining Companies' Financial Standing.

The following is the financial standing on the first Monday of the present month of the mining companies listed on the two exchanges in this city:

	Cash.	Debt.
Alta	$19,762	$.....
Alpha	20,260	.....
Andes	19,278	.....
Bodie Con	*19,034	.....
Benton Con	.....	.....
Belcher	22,160	.....
Belle Isle	.....	†4,852
Best & Belcher	13,572	.....
Bulwer	4,748	.....
Bullion	5,270	.....
Challenge Con	.....	12,763
Caledonia	4,159	.....
Chollar	.....	†23,390
Con. Cal. & Virginia	**405,445	.....
Confidence	.....	†11,903
Con. Imperial	.....	†27,117
Con. New York	†139	.....
Commonwealth	.....	.....
Crocker	5,124	.....
Crown Point	.....	†20,451
Del Monte	.....	16,808
East Sierra Nevada	1,931	.....
Eureka	.....	2,405
Exchequer	8,122	.....
Gould & Curry	19,234	.....
Grand Prize	.....	8,717
Hale & Norcross	†3,227	.....
Holmes	.....	†48,174
Independence	2,197	.....
Julia	4,409	.....
Justice	.....	.....
Kentuck	755	.....
Lady Washington	9,971	.....
Locomotive	977	.....
North Belle Isle	.....	17,565
North Commonwealth	.....	13,853
Mexican	20,566	.....
Mono	13,247	.....
Navajo	.....	21,479
Nevada Queen	.....	.....
Occidental	†11,077	.....
Ophir	17,746	.....
Overman	†55,388	.....
Peer	586	.....
Peerless	8,464	.....
Potosi	.....	37,461
Savage	.....	†4,914
Scorpion	2,335	.....
Seg. Belcher & Mides	9,024	.....
Silver Hill	.....	.....
Sierra Nevada	9,501	.....
Silver King	.....	.....
Standard	.....	13,051
St. Louis	.....	.....
Syndicate	3,856	.....
Union Con	5,878	.....
Utah	3,811	.....
Weldon	6,431	.....

* Bullion in transit and other assets valued at $20,506
† Collecting assesement.
‡ Full bullion return and mine expenses not received.
** Overdraft at bank, $183,546

The following mines owe Sutro Tunnel royalty: Belcher, Chollar, Con. Virginia, Crown Point, Hale & Norcross, Overman, Savage and Yellow Jacket.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, December 4, 1890.

ANTIMONY		@	21
BORAX—Refined, in carload lots		8 @	—
Powdered " " "		8 @	—
Concentrated " " "		7¾@	—
All grades jobbing at an advance.			
COPPER—			
Bolt		23 @	25
Sheathing		23 @	25
Ingot, jobbing		20 @	—
do, wholesale		18 @	18½
Fire Box Sheets		23 @	25
LEAD—Pig		5½@	—
Bar		6¾@	6½
Sheet		7½@	—
Pipe		7 @	—
Shot, discount 10% on 500 lbs	Drop, ₱ lb.	1 90 @	—
Buck, ₱ lbs		2 10 @	—
Chilled, do		2 30 @	—
QUICKSILVER—By the flask		53 50 @54 00	
Flasks, new		— @	—
Flasks, old		54 @	55
CHROME IRON ORE, ₱ ton		10 00 @	—
STEEL—English, lb		16 @	20
Carbon tool		9 @	9
Black Diamond tool		9 @	9
Pick and Hammer		8 @	10
Machinery		4 @	5
Toe Calk		4½@	—
TINPLATE—B. V., steel grade, 14x20, to arrive		— @	—
B. V., steel grade, 14x20, spot		6 12½@	6 25
Charcoal, 14x20		6 50 @	—
do roofing, 14x20		6 00 @	—
do, do, 20x28		13 00 @	—
Pig tin, spot, ₱ lb., nominal		23½@	24
IRON—Bar, base		3 @	3½
Norway, base		4½@	5½
	Spot.	To Load.	
IRON—Glengarnock ton	34 00 @—	30 @	—
Eglinton, ton	34 00 @—	30 @	—
American Soft, No. 1, ton	— @32 00	30 @	—
Oregon Pig, ton	@33 00	— @	—
Puget Sound	34 00 @—	— @	—
Bar Iron (base price) ₱ lb	— @	— @	—
Clay Lane White	— @28 00	26 @	—
Shotts, No. 1	34 00 @35 00	32½@	—
Langloan	34 00 @—	30 @	—
Thorncliffe	34 00 @—	30 @	—
Gartsherrie	34 00 @—	30 @	—
Barrow	34 00 @—	30 @	—
Thomas	33 00 @—	— @	—
Cargoflect	30 00 @—	26 @	—

Sales at San Francisco Stock Exchange.

THURSDAY, December 4, 9:30 A. M.

350	Alpha Con	95c@1.00	
100	Andes	85c	
100	Best & Belcher	2.35	
100	Bodie	9c	
250	Bullion	1.80@1.85	
300	Bulwer	20c	
100	Challenge Con	2.15	
100	Chollar	2.90	
160	Con Cal & V	3.20	
30	Confidence	4.70	
400	Crown Point	1.65@1.70	
200	Exchequer	65c@70c	
130	Gould & Curry	1.60	
100	Grand Prize	26c	
300	Hale & Norcross	1.65	
100	Justice	1.10	
100	Kentuck	1.25	
150	Mexican	2.70@2.75	
200	N Commonwealth	1.50	
250	Occidental	95c	
100	Ophir	3 60	
800	Overman	2.00@2.05	
200	Potosi	1.35	
200	Savage	1.35	
150	Sierra Nevada	2.00@2.05	
300	Silver Hill	25c	
100	Syndicate	10c	
200	Union Con	2.15	
350	Utah	55c	
150	West Comstock	50c	

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terme of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	No.	AM'T. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Baker Divide & M Co	California	18	20	Nov 17	Dec 5	D M Kent	330 Pine St
Confidence Silver M Co	Nevada	17	75	Nov 17	Dec 22	A S Groth	414 California St
Coo Imperial M Co	Nevada	29	5	Oct 15	Nov 15	A McCoy	331 Pine St
Con New York M Co	Nevada	4	15	Nov 12	Dec 17	Jao 5	O E Elliott 309 Montgomery St
Crown Point M Co	Nevada	53	50	Dec 3	Jan 7	Jan 28	James Newlands 331 Pine St
Gray Eagle M Co	California	20	6	Oct 20	Nov 24	Dec 15	J M Buffington 303 California St
Guasacaran & Cal M & M Co	Honduras	3 10	00	Oct 23	Nov 23	Dec 15	Edward Oliver 22 Michigan Ave, S F
Leigh Gravel M Co	California	2	5	Nov 22	Jan 3	Jan 24	E E Hall 320 Sansome St
Mexican G & S M Co	Nevada	41	25	Oct 13	Nov 20	Dec 10	O E Elliott 309 Montgomery St
Morgan M Co	California	14	10	Oct 30	Dec 6	Dec 29	L C Bresse 230 Montgomery St
Northwestern G & S M Co	Br Columbia	1	5	Nov 12	Dec 19	Jan 15	E Bonacina 438 California St
Russell Reduction and M Co	California	7	5		Nov 17	Dec 8	J Morizio 328 Montgomery St
Trinity River T & M Co	California	3	30	Oct 6	Nov 17	Dec 8	Edwin L Griffith 28 California St

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Andes S M Co	Nevada	J W Twiggs	Nevada Block	Annual	Dec 18
Contra Estaca Con M Co	Mexico	George Gale	Nevada Block	Annual	Dec 15
Elko Con M Co	Nevada	W E Loy	310 Pine St	Annual	Dec 15
Gould & Curry S M Co	Nevada	A K Durbrow	Nevada Block	Annual	Dec 15
Ophir S M Co	Nevada	E B Holmes	Nevada Block	Anoual	Dec 17

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Aug 22
Commonwealth M Co	Nevada	R R Grayson	331 Pine St	20	Nov 20
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Dec 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 13.		WEEK ENDING Nov. 20.		WEEK ENDING Nov. 25.		WEEK ENDING Dec. 4.	
Alpha	1.50	1.80	1.10	1.40	1.25	1.35	.95	1.30
Alta	1.15	1.50	.90	1.25	.95	1.10	.90	1.10
Andes	.85	1.60	.80	.95	.85	1.15	.80	1.00
Belcher	2.20	2.65	1.80	2.30	1.90	2.45	1.80	2.25
Best & Belcher	2.70	3.30	2.35	2.75	2.40	2.85	2.20	2.45
Bullioo	2.70	3.25	2 15	2.60	2.35	2.60	1.75	2.30
Bodie Con	1.10	1.90	.65	1 25	.75	.90	.90	1.10
Bulwer	.30	.40	.20	.40	.20	.25	.25	....
Commoowealth	2.50	2.85	2.50	2.65	2.30	....	1.90	2.15
Con. Va. & Cal	3.60	4.45	3.35	3.85	3.60	3.90	3.15	3.60
Challenge	2.60	3.25	2.10	2.6*	2.10	2.70	2.05	2.30
Chollar	3.25	3.60	3.35	3.80	3.45	3.70	2.75	3.60
Confidence	7.00	7.37	4.25	6.75	4.85	5.50	....	....
Con. Imperial	.25	.35	.25	*.30	.25	.30	.25	.30
Caledonia	.33	.45	.25	.30	.30	.35	.35	....
Crown Point	2.20	2.55	1.65	2.20	1.70	2.15	1.55	2.10
Crocker	.25	.30	.20	....	....	....	....	....
Del Monte	.55	.60	.60	.70	.60	....	.55	....
Eureka Con	3.50	4.00	3.50	....	3.75	....	3.75	....
Exchequer	1.10	1.20	.70	.95	.75	.95	.65	.85
Grand Prize	.30	....	.25	.30	.25	.30	.30	....
Gould & Curry	1.95	2.30	1.55	2.00	1.65	1.85	1.55	1.75
Hale & Norcross	1.75	*2.40	1.95	2.20	1.95	2.20	1.60	2.00
Julia	.25	.30	.15	.25	.15	.20	.20	.30
Justice	1.35	....	1.05	1.25	1.10	1.30	1.10	1.15
Kentuck	1.65	1.90	1.10	1.45	1.30	1.55	1.10	1.50
Lady Wash	.35	.40	.30	.35	.25	.35	.30	....
Mono	.40	.55	.40	.55	.50	.60	.60	.70
Mexican	2.50	2.95	2.15	2.50	2.45	2.90	2.50	2.70
Navajo	....	....	.30	.40	.30	.35	.35	....
North Belle Isle	1.35	1.50	1.10	1.30	1.20	1.25	1.00	1.20
Nev. Queen	.85	1.10	.85	.90	.90	....	.75	.90
Occidental	1.10	1.75	.91	1.15	1.05	1.20	.90	1.15
Ophir	3.80	4.40	3.60	3.80	3.70	4.00	3.60	3.85
Overman	2.00	2 25	1 65	1.95	1.65	2.00	2.00	2.10
Potosi	7.00	7.50	6.25	7.00	6.62	7.00	4.70	6.50
Peerless	.30	....	.15	.20	.20	.25	.20	....
Peer	.20	....	.15	.20	.20	....	.15	....
Savage	2.35	2.95	2.00	2.40	2.05	2.45	1 85	2.30
S. E. & M	1.25	*1.55	1.10	1.35	1.10	1.40	1.10	1.35
Sierra Nevada	2.30	2.95	2.05	2.45	2.05	2.35	2.00	2.20
Silver Hill	.20	*.35	.25	.30	.30	.35	.25	.30
Scorpion	.25	....	.20	....	....	....	.20	....
Union Con	2.20	2.80	2.05	2.30	2.10	2.30	2.00	2.20
Utah	.80	1.05	.65	.80	.65	.85	.65	.75
Yellow Jacket	2.45	3.07	2.10	2.50	2.15	2.60	2.10	2.50

* Assessment delinquent.

Mining Share Market.

It is well that the average bull operator gave thanks on Nov. 27th, for since then the market has been on the down grade, with a decided setback in the middle shares under a break in Potosi and lower prices in the Gold Hill shares under a break in Crown Point. The fall in Potosi we indicated in our issue of Nov. 15th. It was engineered by the bears under a report of the drifts on the 1230-foot level getting into old works. The decline in Crown Point was due to an assessment of 50 cents a share. In last June we stated that when the Potosi winze was sunk to the 1230-foot level, connection would be made with the drifts from the Ward shaft and also the old works on the north side. These connections, we stated, would be made to give better ventilation so that prospecting work could be better done on the various levels in Potosi and Bullion. This connection is of quite an important character for the middle mines, although it has been used by the bears to break the market.

The street is full of bear rumors that prices will go still lower—no stock to sell at over $3 a share. These reports, it is claimed, are put out by a ring that is trying to buy stocks so as to keep control of certain mines they have always secured through proxies, but which it is likely they will not be able to do again. It looks as if some of the leading members of the mill ring are helping the stock pool to break the market so as to buy stock. There can be no doubt but leading stocks have been for many months past drifting into strong hands, and the more the above two pools tried to get them back by stealing deals and lowering prices through assessments, delayed work and keeping back information from the mines, the more stocks they lost. It is very generally claimed by close observers of the situation, that in their desperation more assessments will be levied and no ore be shown up until some of the mines change hands. Holders of stocks must be prepared for this. It is an interesting fight, and highly important developments in the stock market are liable to be made either before or soon after the turn of the year. The market, when the fight is well under way, will probably have sharp ups and downs, which are liable to catch many outsiders who buy on a margin and also those who short the market.

It looks as if the depression in the stock market, which has continued for over four months, is about at an end, and the person who buys any of the cheaper stocks and pays cash will not take any risk of a good round profit before long. Within the past week large lines of margin stocks were thrown on the market.

The market opened this (Thursday) morning steady. After Call prices advanced, but toward noon they began to set off again. The points are out for slightly lower prices, then a more active bull campaign.

The Kentuck Mining Co. has called a special meeting to increase the original number of shares to 105,000 with a par valuation of $10,500,000.

From the Comstock mines our advices report a more cheerful feeling than at any time this year. This feeling is based on the nature of the work going on, which precludes the mill ring from keeping important work and strikes from being known. Important prospecting work was started the past week in Savage, which will show good result soon, provided the management does not suppress it. A change in the management of one or more of the mines is among the certainties in the near future outside of Gould and Curry and Best and Belcher which are liable to pass into other hands at the annual elections to be held in this month. From the outside mines the news is of a more important character. In the Quijotoa district powerful drills are being used with good result. In the Tuscarora district the downward continuation of ore in the Belle Isle has been struck on the 450-foot level. It is said to be rich and wide. From several of the other mines good news comes to hand. In Bodie very active prospecting work is going on, with the most sanguine expectations entertained by the better-informed that a very rich strike is among the possibilities of the near future. The mill is running on tailings. From Mono and Bulwer the news is of a prospecting character. The latter company is to levy a 25-cent assessment at an early day.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Modoc and Lassen Cos.
GEO. WILSON—Sacramento Co.
J. P. QUINETTE—San Francisco.
J. C. HOAG—San Francisco.
SAMUEL CLIFF—Creston, Cal.
W. W. THEOBALDS—Alameda and Contra Costa Cos.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
GEORGE EVANS—Santa Clara Co.
MRS. M. E. DUDLEY—Ventura Co.
ANDREW REID—Monterey Co.
B. F. BELT—Shasta Co.
FRANK S. CHAPIN—Colusa Co.
WM. M. HILLEARY—Oregon.
WM. HOLDER—Oregon.
R. G. HUSTON—Montana.
H. G. PARSONS—Nevada.

Assessment Notices.

LEIGH GRAVEL MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Echo Mining District, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 22d day of November, 1890, an assessment, No. 2, of five cents (5c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary at the office of the Company, 320 Sansome Street, Room 57, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 3d day of January, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on SATURDAY, the 24th day of January, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

E. E. FALL, Secretary,
Office, 320 Sansome Street, Room 57, San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 20) levied on the 20th day of October, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Buffington, J M, Trustee	528	2,000	$120 00
Barrows, A W, Trustee	547	1,000	60 00
Bowers, D	379	20	1 20
" "	404	500	30 00
Bogart, C H, Trustee	488	105	6 30
Carnee, W A	252	416	24 96
Francie, H L, Trustee	444	1,500	90 00
Nash, H W	269	104	6 24
Nordman, Leon	514	100	6 00
Roseknans, H M	39	600	36 00
Stout, C S, Trustee	476	2,000	120 00
" "	477	953	57 18
Searles, W A, Trustee	518	1,000	60 00
Steteon, A M, Trustee	520	5,000	300 00
Taylor, J N, Trustee	532	1,040	62 40

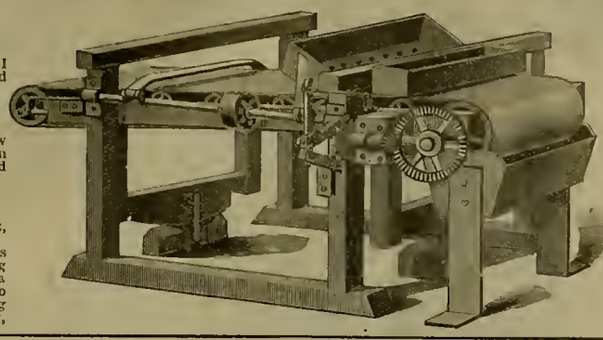
And in accordance with law, and an order of the Board of Directors, made on the 20th day of October, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on MONDAY, the 15th day of December, 1890, at the hour of one (1) o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

A. W. BARROWS, Secretary pro tem.
Office, Room 11, No. 303 California street, San Francisco, California.

SITUATION WANTED—MINING ENGINEER, eleven years' practical experience in smelting and milling, six years as Manager and Superintendent, desires employment. Just returned from Central America. Highest testimonials and references. Speaks Spanish fluently. Address, GRINGO, Box A, this office.

TULLOCK IMPROVED ORE CONCENTRATOR.

Patented October 8, 1889, and December, 1890.



ANGELS, CALAVERAS COUNTY, Nov. 22, 1890.
JAMES TULLOCK, Esq.—Dear Sir: I am pleased to state that I have used two (2) of your Sulphuret Concentrators in the Gold Cliff Mill, since the first day of last May, and that they have given entire and splendid satisfaction, concentrating the sulphurets from 60 tons of ore every 24 hours. Your Sulphuret Concentrators are superior to any that I have seen, being simple in action, positive in effect, admirable in construction, of few mechanical parts, and admirably adapted to the concentration of any kind of sulphurets. I therefore cheerfully recommend them to the mining fraternity. Respectfully yours,
WOODSON GARRARD, Supt. Gold Cliff Mine.

HELENA & IDAHO GOLD MINING CO., SUPERINTENDENT'S OFFICE, GIBBONSVILLE, IDAHO, Oct. 6th, 1890.
MR. JAMES TULLOCK, Angels, Cal.—Dear Sir: Mr. Arnold was saying the other day that you were talking something of coming up this way, and I have thought that perhaps you might be a little uneasy about your concentrators. You need have no anxiety about them whatever, as the one we set up is running all right and has not given a minute's trouble since starting, and the other one is all ready to start. They were so easy to set up and run that I forgot all about the "letter of instructions" until they were set up and running and you recalled to my mind your letter and instructions. Yours truly,
MYRON K. RODGERS, Supt.

ANGELS, CALAVERAS CO., Nov. 22, 1890.
JAMES TULLOCK, Esq.—Dear Sir: We have used two of your Sulphuret Concentrators in the Madison Mill, (10) ten stamps, for over six months last past, and I hereby testify that they have given every satisfaction, and in every sense fulfilled the great opinion I had formed of their superiority. They are easily handled, readily kept in order, require but little watching, are exceedingly simple in construction and absolutely positive in their work. In my opinion, they are superior to any other in the market, doing effective work in the treatment of large quantities of sands. Sincerely yours, T. M. LANE.
Supt. Madison Mine.

Price, $350, delivered at Factory, Angels, Calaveras Co., or at Milton railroad station free of charge. For further particulars, address

JAMES TULLOCK, Angels, Cal.

Attention, Southern California Miners.

WORKS FOR SALE.

The Works are situated at Daggett, Cal., in the Calico Mining District, and on the side-track of the Atlantic and Pacific Railroad. They contain a first-class 50-horse power engine and 45-horse power boiler, with Ore Crusher and other machinery, Mill Scales, Assaying Outfit, etc., all nearly new. Also upon the premises an office building and a comfortable dwelling-house (portable). The above can be had at a bargain. Apply to W. M. SMITH, 526 Jones St., San Francisco.

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SEND FOR CIRCULAR. E. P. HEALD, President.
C. S. HALEY, Secretary.

Testing and Working Silver Ores

A VALUABLE BOOK.

An illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope.

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working samples, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat, of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles Smelting, Mexican process, Chilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, sorecns, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings, and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

Price, post free, $2.00. Sold by DEWEY & Co., Publishers, 220 Market St.

DIVIDEND NOTICE.

OFFICE OF THE PACIFIC BORAX, SALT and Soda Company, San Francisco, November 28, 1890. At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 38) of One Dollar ($1.00) per share was declared, payable WEDNESDAY, December 10, 1890, at the office of the Company, No. 230 Montgomery Street, Rooms 11 and 12. Transfer books close December 5, 1890, at 3 o'clock P. M.
ALTON H. OLOUGH, Secretary.

DEWEY & CO.

AMERICAN AND FOREIGN PATENT SOLICITORS

ESTABLISHED 1860.

OFFICE OF THE "Mining and Scientific Press" Pacific Rural Press

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TAKE ELEVATOR No. 12 FRONT ST.

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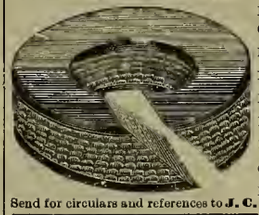

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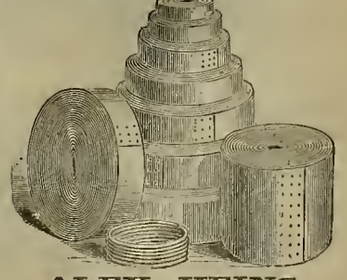

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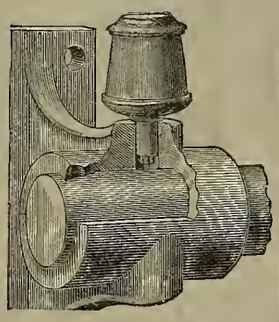

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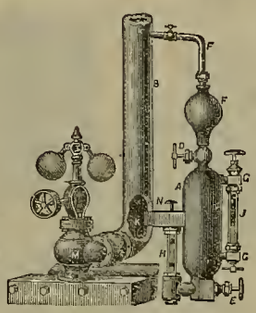

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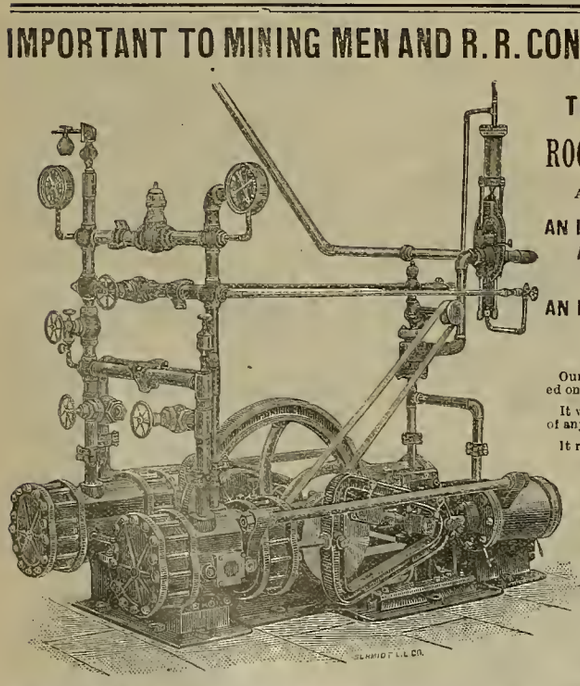

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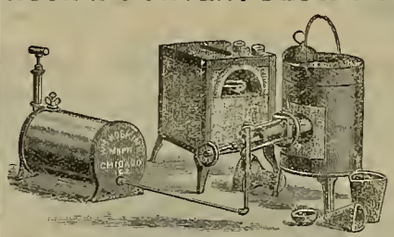

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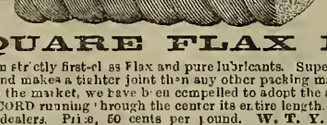

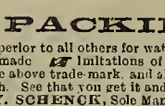

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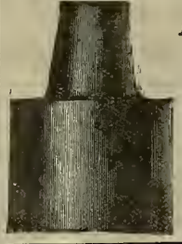

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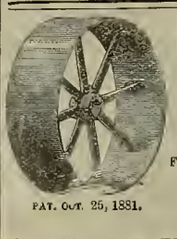

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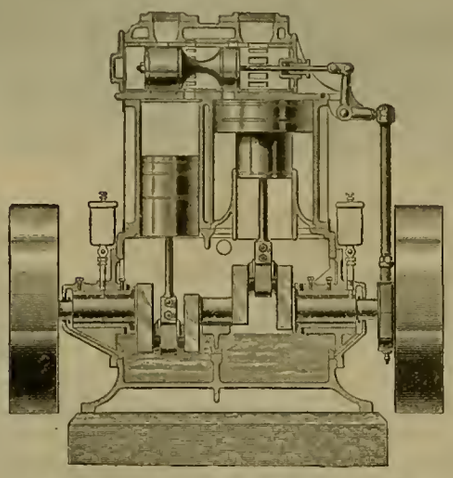

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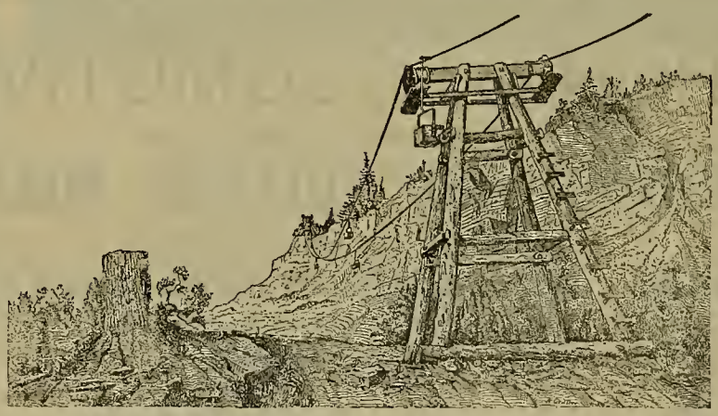

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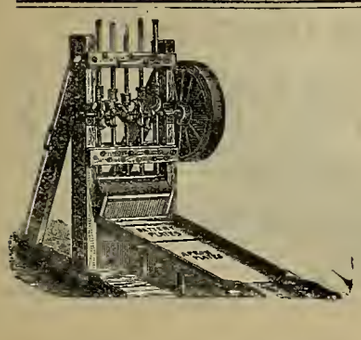

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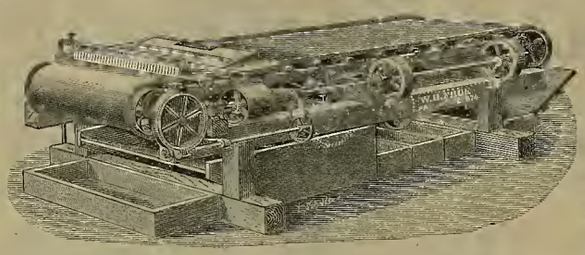

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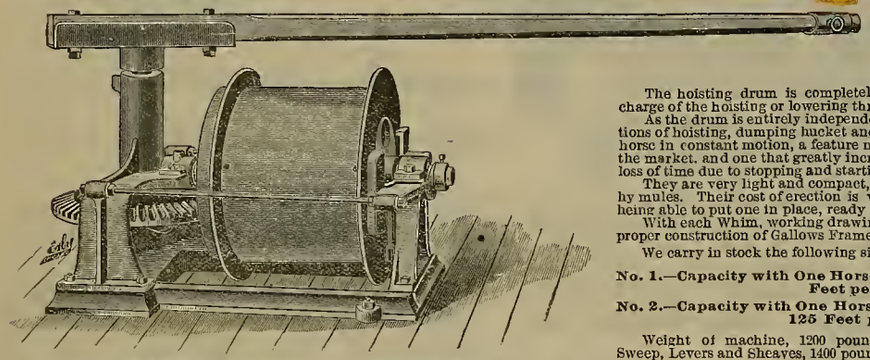

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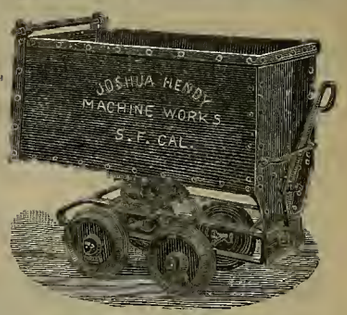

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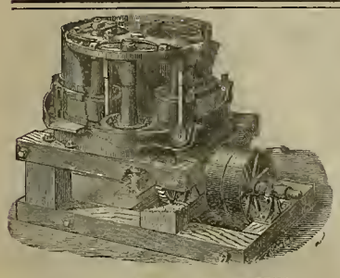

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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Gold Mining and Milling in Korea.

Gold mining in all its branches is conducted with very primitive methods and appliances in the Peninsula of Korea, this industry being there in a still more backward state than in China, to which that country is tributary. Mr. Willard I. Pierce gives, in a paper read before the American Institute of Mining Engineers, the following account of the manner in which the business is carried on in the Kingdom of Korea:

In mining where the rock is hard, wood is piled up near the face of the tunnel or drift and then set on fire. The fire burns for 24 hours, after which, three or four days are given for the rocks to cool, before the miners go in and extract the loosened material. The only tools in use are a hammer, a steel gad about five inches long, and a flat spoon-shaped basket. The pay-streak or chute is closely followed, and in places the workings are very small and intricate. Rock not yielding more than $6 per ton is not extracted. The manner of opening a mine is to begin on the outcrop, where the rock pays, sink a shaft or run a tunnel on the vein, and follow the pay-streak and more easily worked ore. When this is exhausted, or the influx of water interferes, the opening is abandoned and operations are begun again at a new spot on the outcrop. The place usually selected is as high up on the mountain as possible, and in no instance is advantage taken of the topography by running a cross-tunnel to tap the vein.

The ore is brought in baskets to the surface, and there placed in sacks, holding about 150 lbs. each, and taken to be crushed. The rock is first crushed between two stones, as shown in the cut here given. The upper stone is oval and rounded on the bottom, so that it can be readily rocked on the under stone. Two pieces of wood, used for handles, are placed one on each side, in grooves in the upper stone, and held in position by means of straw rope. The lower stone is not smooth on top, but exhibits three elevations running lengthwise, with shallow depressions between them. The middle elevation acts as a fulcrum on which the upper stone may be rocked. From two to ten men, according to the weight and size of the stone used, are employed in rocking. With four men, from 300 to 350 pounds of rock can be crushed per day, the stone making 50 complete oscillations per minute. The men squat on each side of the stone and move it to and fro by means of the wooden handles. The ore is fed in pieces up to the size of an egg, or even larger, by one of the men. During the crushing one man on each side, as the stone rocks from him, uses a stick as a scraper to stir the crushed rock. When the ore is fine enough, it is swept out on a piece of cloth, placed at one side of the stone, the rocking being continued all the time. After a certain amount has been crushed, it is usually put through a horse-hair sieve and the coarser portion is treated again.

KOREAN GOLD-MILL.

An upper stone, intended for four men, measured 23 inches in length, 20 inches in width at the base and 15 inches in hight. Crushing is usually performed in sheds to prevent the wind from blowing any of the fine stuff away.

The crushed ore is taken to men who rub it between stones until it is very fine; the rubbing is generally done wet. The powdered ore is received by other workmen, who pan it and save the free gold. The pan is of one piece of wood, 20 inches in diameter and 5 inches high, and the men who use this instrument are the most expert panners I have ever seen. The pan is not held in the hands, but floats on the surface of the water, one side only being raised or lowered to agitate the contents. As the pulp is very fine, and the gold in the same condition, the top of the water in the pan is frequently sprayed, so as to settle any gold that may be floating. The first tailings are washed off directly from the right-hand side of the pan. After this, the sulphurets and gold are collected on the right-hand side of the pan, and the tailings on top of the sulphurets are, by a few skillful movements, washed over to the left-hand side. The pan is then half revolved, and the tailings are washed off from the right-hand side. The same operation is repeated after the tailings have all been removed with the sulphurets and gold, the former being saved and again rubbed. No quicksilver is used; but I do not think that there is any loss in free gold.

Fig. 1—CUT SHOWING LEAD CYLINDERS BEFORE AND AFTER EXPLOSION.

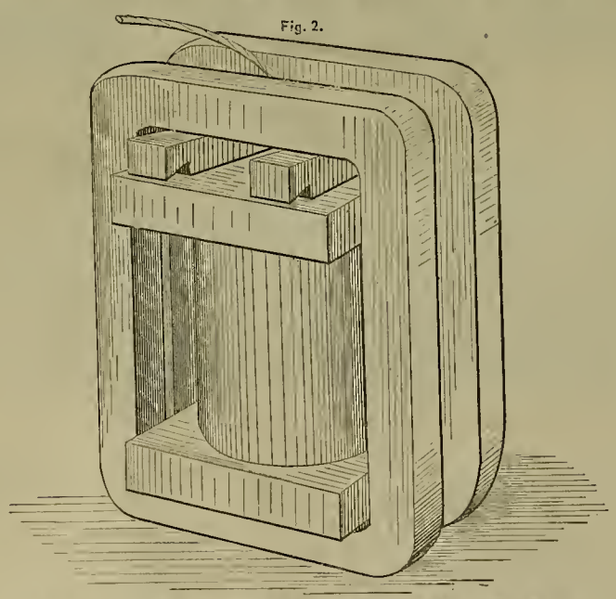

Fig. 2.

Fig. 2—CYLINDER AND FRAME READY FOR EXPLOSION.

Powder Tests.

Some tests of the relative strength of nitroglycerine and other explosives were recently made under the supervision of Frederick W. Clark of Chicago. One of the tests made in connection with these experiments was directed to ascertaining the amount of charge that could safely be fired without rupturing the cylinders. The cut, Fig. 2, here shown, illustrates the apparatus employed for this purpose. The tests so made establish that a six-gramme charge is about as much as the cylinders will stand, without danger of rupture, when the most powerful explosives are used.

The effect of the explosion on the cylinder was barely perceptible on the exterior. The interior of the cavity was usually left smooth. Fig. 1 shows the nature and the extent of the deformation caused to the cylinder.

A Mexican Paper reports that mining is being carried on with great activity in the State of Sinaloa. The camps are said to be numerous and important, and the ore-mills are equipped with the most modern and improved machinery. The Administration gives ample protection to miners of all nationalities. Recently a discovery of platinum was made, and as that valuable metal has within a short time advanced 200 per cent in Europe, everybody concerned is indulging the hope that the ore will prove to exist in large quantities. "Discoveries," if they go on at their present rate, will soon become embarrassing.

S. T. Taylor desires a permit from the municipal authorities of San Jose to prospect for cinnabar within the limits of the city reservation.

The Thomson-Houston Company at Lynn use over 3000 pounds of mica a week in their factories.

Three and a half millions of people are always on the seas of the world.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Correspondence From Mexico.

Mining in the Vicinity of Hermosillo, State of Sonora.

EDITORS PRESS:—Since the rainy season commenced, the business of mining has been looking up in this section of Sonora; a number of new companies are taking hold of properties, developing them and putting in machinery. The old companies, as a rule, are meeting with success, though some, of course, are not. It is not to be expected that everything undertaken will succeed. Success generally comes only as the result of a hard-fought battle against heavy odds.

The property known as the Popocatapeti and comprising a group of mines situated some 36 miles north of Hermosillo in what is called the "Sierrita" has been the principal producer up to this time. This, with several other mines in that locality, is the property of a syndicate of Mexicans, residents of Hermosillo, at the head of which is Dr. Rafael Fort, the Internal Revenue Agent for the State of Sonora. From these mines large shipments of rich ore have been made for many months past, this ore running frequently as high as $600 per ton. They have taken out many thousands of dollars at small expense. A number of years since Magruder & Fresh had a mill in operation, located near these mines on a lode called the Santa Elena. Their ore was very good and things were prosperous with them for a time, but in the deepest workings, where the vein was apparently most promising and likely to continue, a "horse" was encountered, cutting out the pay streak entirely, nor has much prospecting work since done discovered it again. After prospecting on the outside, as was supposed thoroughly, without the discovery of anything of value, the mill and other movable property was transferred to El Yeso, where the owners, after many discouragements, are meeting with deserved reward for their perseverance. One can never say what is in the ground, as prospectors the world around can testify.

A syndicate of Mexican capitalists has a concession from the Federal Government in a district called the "Alameda," near Opodepe. Some prominent Government officials are connected with this enterprise, and it is stated that during the short time they have been engaged in exploring their tract of country, they have discovered several valuable gold and silver bearing ledges. The small mill on the San Geronimo mine has been leased, and is being run by this company on ore from their mines.

Dr. Ricardo Johnson, an active mining man, whose name is a household word all through this State, has some five or six mines in this Alameda district, and I have been told that Mr. E. A. Price, who has a fine mill and some valuable property near Minas Prietas, is about to take hold, open and outfit them.

No one seems to know why the San Ricardo mill is being dismantled and sold piecemeal, but such is the fact. About a year ago the mill suddenly stopped while the company was involved in a lawsuit about some woodland. The mine is said to be good, although some difficulty was found in saving a high percentage of the gold which was amalgamated in the battery and on plates; the sulphurets which carried gold also being concentrated on Frue tables, never, however, with good results.

It is reported that the St. Helena gold mine at Delicias in the Arlape district is soon to start its 60-stamp mill. This is a large mine, although the ore is low grade, yielding only $9 to $12 per ton gold and silver. A large amount of money has been spent by this company first and last, and as yet in the nine years past they have had poor returns. Many improvements have been made here of late and a good deal of development work done in the mine in depth.

Near Babiacora, midway between Delicias and Ures, two companies are proposing to prosecute their work with renewed vigor. The Milford Mining Co. owns a large and valuable gold ledge here, but the ore is base. A year ago they erected a Wiswell mill which did not prove a success. It is now proposed to put up a ten-stamp mill in its stead, and in the hope of being able to make this a paying property.

About two miles from the Milford is situated the Bonanza mine, owned by Mr. S. R. Norton, who has associated with him Mr. Balond of San Francisco and a brother from Chicago. The mine is said to look decidedly well, and their intention is to put up a Huntington mill, two pans and a concentrator very soon.

The country around Babiacora is essentially a mineral one, there being from there east to Oposura a stretch of territory that was extensively worked by the ancients, but still remains but little prospected.

In the Gavilan mines a new strike of rich ore is reported. The owners of these mines have had many difficulties to contend with recently. But the outlook is now more favorable. Everybody speaks well of their mines, especially the miners and others who have seen them.

The Yeso property has been paying handsomely for many months past, though its owners had before had rather more than their share of tribulations and trials.

The winter months in this country are delightful, though the summers are rather warm, except at considerable altitudes, where the heat is not so extreme.

In the matter of food, however, the miner does not fare as well here as in California.

"AMERICANO."

Hermosillo, Sonora, Nov 24, 1890.

Wild-Cat Mining Shares.

We reproduce the following from a Colorado paper for the reason that what is true in that State is true also in California and we suppose the world over, wherever much mining is being done:

There is scarcely a week that this office does not receive a letter from some one in an Eastern State asking for information regarding the value of certain mining stocks. Usually it is an administrator of an estate who finds the stock among the assets of the deceased. It is rare that the companies or their property are known to us or to any mining men in the State, and never yet have we heard of a case where the stock possessed any value.

The frequency of these occurrences, and the fact that a great many thousand mining companies are unknown but incorporated in this State, indicate that a large business is done in the way of selling wild-cat and worthless stocks in the East. Probably the great majority of the incorporated companies were formed for that purpose only.

So far as we have been able to learn, the method of their operations is the same in all cases. Some sharp fellows from the East come to Colorado, pick up a prospect or two for nothing and on them organize a company. They get reports from some reported to be noted experts, and on the basis of these peddle stock in the East. They often have some one in a bank or some so-called banker in Colorado to give as a reference, but generally keep the Colorado public and press from all knowledge of their operations. In our "rogues' gallery" of mining prospectuses we have some fine exhibitions of their work. The predictions made by their experts are brilliant emanations from able liars, and should be addressed to fools. There are cases, too, in which well-known citizens or business men have loaned themselves to these robbing schemes. But generally the manipulators and participants in the spoils are all unknown in Colorado. There is, however, an occasional exception. There is one merchant in this city, prominent in business circles, who has obtained a good many thousand dollars from the South for wild-cat mining stock, not a share of which has any value. In marked contrast to that is the action of another Denver man, whose name is known all over the State, who was deceived into allowing his name to be used as reference. When he learned the worthlessness of the stock, he bought every share that had been sold in the East or elsewhere on his recommendation, paying all that had been paid for it.

The Trades in New York.

Quite recently a careful inquiry has been made into the condition of the various trades in New York City, and the conclusion is that the laboring man is now better paid, housed and fed than at any former date. Workmen are more thoroughly organized than ever, and the work of perfecting their organization is constantly going on. The tendency is to the decrease of the Knights of Labor, the local organizations of which were largely made up of men of different trades in one body. In place of the Knights has grown up a powerful body, the American Federation of Labor, organized each trade by itself. At the last report there were 62 national and international separate trades, comprising 586,000 members, belonging to the Federation, of which Samuel Gompers is president. In the last six months about 300 local organizations have been added to the Federation. The plan of keeping the affairs of each trade as much as possible in the hands of men belonging to that trade, which is the peculiar feature of the Federation, works well. New organizations are constantly springing up. In many trades it is almost impossible to get anything done without paying union wages and conforming to union rules. One tendency which workmen can hardly view with satisfaction is to drive a great deal of work out of the city to points where there is more freedom of action. This is noticed in the printing business and in the building trades. Doors, sashes, window-blinds, moldings and even trimmings are made in great factories in various parts of the country by non-union labor and brought here to be put together in buildings. This is also true of immense quantities of iron and stone work, which is got ready elsewhere and merely put together here. The city contractors for large buildings find it very difficult to compete with out-of-town contractors, who underbid them by means of facilities to do the greater part of the work elsewhere. There is a growing tendency to lessen strikes and keep the men more steadily at work by agreements between the bosses and the union men for a certain scale of wages to be renewed every year. The men fix the scale and the bosses agree to it, and really do not care much what the scale is so long as all the bosses are compelled to pay alike. The stone-cutters, masons, plasterers and tin-roofers have adopted the plan, with good results.—*New York paper.*

THERE are said to be 1500 Chinese laundries in New York City, earning over $3,500,000.

Workmen and Labor-Saving Machinery.

The spirit with which a certain class of workmen view the introduction of labor-saving machinery and mechanical appliances which from the short range of observation of the workers referred to seem to threaten changes in processes without counterbalancing compensations, has called forth some thoughtful remarks from an English publication, the *British Mercantile Gazette*. The writer demolishes many of the sophistries of the superficial thinkers who seem to lag sadly behind the age, and are altogether blind to the advantages which they enjoy as a result of ideas developed by the very spirit of progression which they condemn. The writer says:

Nearly every great triumph that has been made by the introduction of labor-saving machinery has been accomplished in the face of strenuous resistance from workmen, the class which has obtained the largest share of the benefit from the employment of such machinery. The blind and stupid feeling of hostility to labor-savers still exists in strength that has had little abatement. Only the other day strong opposition was made to the introduction in a shoe factory of an improved lasting machine, which proposes to reduce the amount of hand labor now required. Last winter an appeal was actually made by a labor organization to have prohibited the employment of a hand-press in the Treasury for the printing of paper money in America. Our readers will learn with astonishment that a trades-union in Chicago positively protested against the scheme by which the 50 American workingmen who recently passed through London were sent free of cost to them on an educational trip to Paris. The following is the extraordinary reason assigned for the protest: "Such a visit will tend to enlighten and instruct the workmen. This will increase their productive capacity, and such increase, in our judgment, only tends to the direct impoverishment of the workers." It is difficult to contemplate without a feeling of melancholy the fatuous ignorance and stupidity of such a declaration.

An increase of the power of producing articles that men require is an increase of the power of producing wealth. A workman's wages are his share of the gross amount of wealth created. The proposition above quoted, therefore, involves this assertion: That the greater the quantity of wealth produced, the poorer the producer becomes. If we were without experience of the actual operation of the matter, we should be entitled to believe that the larger production would give larger wages, and this, in fact, is precisely what has happened and does happen. It is wholly beyond dispute that while wages have steadily advanced with the continuous development of labor-saving machinery, the prices of commodities have with equal steadfastness declined, so that not only has the workman more dollars to spend, but each dollar will buy more of needed things than it would have bought in any previous age of the world. Not only is this indisputably true, but while the labor-savers have brought to workmen a greater capacity for purchase, they have brought to them other blessings of a no less desirable character. Machinery for the economy of human labor, for lightening the dead burden of toil which has pressed heavily upon man since he was first created, belongs almost wholly to the present century; and during this century the laborer has made further advances in dignity, in social consideration, in political power, than he made during any five centuries preceding. It is easy to understand why the labor-saving machine should have wrought out such an issue. It gave to the workman more money, more leisure, and a greater share of education, and thus put him higher in the social scale and clothed him with greater power. If he had used more wisely his opportunities he would be even better off than he is now. The measure of his blindness and folly is accurately indicated by the circumstance that, in spite of what machinery has done for him, he persists in making war upon it. His best friend is the progressive inventor, but the workman stupidly regards that individual as his worst enemy.

The opposition to the increase of production by improved machinery is based upon the widely held belief that there is only a certain clearly defined quantity of work to be done, and that if a machine be devised which will do as much as two men, it will force one man into idleness. This is a sheer delusion, proved over and over again in the years past to be without any foundation in fact. It involves the theory that there is continual danger that too many good things will be made; in other words, that we are in constant peril of having overproduction. No such thing as overproduction of the necessaries of life is, however, possible. The proof of this assertion is that there will never be too great a quantity of good things until human desire is satisfied, and human desire is in truth insatiable. How many persons are there in this country who have as much of everything as they want? Not one. No such persons exist or will exist. Indeed it is obvious that the vast majority of men never have anything that can be fairly regarded as an approach to satisfaction of their reasonable needs. While this state of things endures, it is incontestably foolish to entertain any dread of overproduction. What is wanted is that some plan shall be devised for enabling men who want to obtain the power to get it. Labor-saving machinery in a measure performs this function by cheapening commodities, while it advances wages. It would do much more in this direction if the men who used it had sense enough to perceive what are the true obstacles to their success in life.

Steel-Wire Cables.

On Sunday, Nov. 23d, the Ferries & Cliff House Cable Railway Company put a new cable on its branch running from the power-house, corner of Mason and Washington streets, to Central avenue, via Jackson and Washington streets.

The business on this branch is quite heavy. The cable crosses both the Sutter-Street and California-Street extensions, and makes seven right-angle curves besides passing over two high hills. It is considered a severe test on the cable, and such as only the highest quality and make can withstand.

The cable above referred to was 26,500 feet long, 1¼ inches in diameter, and weighs 58,000 pounds. It was made by the California Wire Works, who have been for 32 years in the business of manufacturing wire cables and ropes, and who probably, of all wire-cable manufacturers, have had more direct experience with the cable system than any other concern in the world, Mr. Hallidie, the inventor of the cable system, being also the president of the California Wire Works.

The work performed by this cable is remarkable as compared with the cables made by other makers and used on the same place under the same conditions and circumstances, and entitles it to be noted by this journal, which is at all times pleased to give credit to our home manufactures when justly entitled to it, and which the following interesting record verifies:

The first rope put on this route was made by the California Wire Works, in this city, and did its work faithfully for 177 days.

The second rope was made in the Eastern States and lasted 110 days.

The third rope was also made in the Eastern States and lasted 104 days.

The fourth rope was made by the California Wire Works and lasted 154 days.

The fifth rope was made in the Eastern States and lasted 131 days.

The sixth and last rope, taken off Nov. 23d, was made by the California Wire Works and lasted 303 days, and during that time traveled over 43,000 miles.

The total life of the three Eastern-made cables has been 345 days, or an average of 115 days each, while the total life of the three San Francisco made cables has been 634 days, or an average of 211 days each, or 83⅓ per cent over the Eastern-made ropes, and the rope just taken out has lasted 2 3 10 as long as the longest-lived rope of Eastern make.

Our inquiries have gone further, and we have ascertained that the cables on the other branches of the Ferries and Cliff House Railway Company, which have been made by our local manufacturer in competition with the Eastern makers, have in all cases done better service, the lives of the cables which have been worn out being as follows:

Power-house to Market street, via Powell; Eastern cables have averaged 124 days; California Wire Works, 180 days.

The cable now in use made by the California Wire Works has been running 238 days.

Power-house to North Beach, via Mason street: Eastern cables have averaged 120 days; California Wire Works, 190 days.

The cable now running was made by the California Wire Works and has been in 296 days.

Power-house to the ferries, via Clay street and Sacramento street: Eastern cables have averaged 116 days; California Wire Works, 185 days.

The present cable has been running 271 days, and was made by the California Wire Works.

How much longer the rope now in will last we cannot of course say, but as in cable railways, so in railway cables, we are glad to show that San Francisco takes the lead.

We are likewise assured that similar results have been obtained in other lines of this city.

These cables were made in a special manner by machinery, patented by Mr. Hallidie.

The body of the truck on which these heavy cables are hauled is made of heavy wrought-iron girders, and has axles 8" diameter and tires 16" wide. The great width of tire enables it to pass over ordinary roads without doing them any injury. Sometimes as many as 60 horses have been employed in hauling a load of 90,000 pounds.

AT the Iron-molders' headquarters a notice has been received from the executive board of the National Union declaring three Eastern strikes off and admonishing all local unions to keep out of trouble. An amendment to the constitution has been proposed providing that no local union shall go out on a strike until its grievances have been officially investigated by the national body.

THE Helena *Journal* announces that the effort to establish a Mining Stock Exchange in that city has proven a flat failure.

THE State of Wyoming proposes to hold a mining convention in Cheyenne about December 15th.

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San Bernardino County.

Its Mineral and Other Resources.

NUMBER XXIII.

[Written for the Press by James H. Crossman.]

Clark Mining District—Continued.

In this district both wood and water are sufficiently abundant for all practical purposes—the wood mesquite and nut pine; the water flowing from living springs. The strike of the vein is northwest and southeast, dipping northeasterly at an angle of 45 degrees. The footwall is usually a dolomitic limestone and the hanging-wall a calcareous shale. The veins are evidently true fissures and go to the deep. The largest and most prominent group is situated at an altitude of 5600 feet above the level of the sea and from four to five miles in a northwesterly direction from the town of Ivanpah. This group contains the following veins, viz: The Monitor and the Beatrice No. 1 and No. 2, owned by Julius Jacobs of San Francisco. These veins were discovered in the spring of 1870 and have been regular bullion-producers ever since. The ores treated have been worked in a five-stamp mill. The veins, though small, have the Alley, its ore being of the same character and values. This mine has been developed by a tunnel 300 feet in length giving backs of 250 feet on the vein, which is 12 inches thick. This mine has also been profitably worked since its discovery.

The Alps lies east of the Stonewall and is a dividend-payer.

The Copper World lies on the southerly flank of Clark mountain at an elevation of 5000 feet above sea level. Croppings extensive, showing evidence of a large deposit. Ores oxides and sulphides, with some metallic copper. It is developed by two shafts of 50 feet each and two tunnels—one 75 and the other 15 feet long. Ore varies from 20 to 82 per cent copper. A number of shipments was made to San Francisco in 1869 of 75 per cent copper. Vein about 50 feet, lying between walls of lime and porphyry.

Mescal Mining District.

This district is situated six miles south of Ivanpah. It was discovered in 1885. Work of development by McFarlan and Barrett.

At the Cambria mine, the gangue is quartz inclosed in dolomitic limestone; course southwesterly and northeasterly; dip 30 degrees east; assay values, silver 50 ounces and gold $5 per ton. In 1886, parties in Los Angeles purchased the property and erected a 10-stamp mill. Since that time the mine, though possessing that took its rise in the summit and debouched into the valley. The alluvions that formed the bed of this ravine showed evidences of mineral stain, which increased as the party advanced—the ravine finally contracting and forming a box canyon. The erosive action of the water had cut a deep gorge by the side of a mammoth ledge of quartz that formed a westerly bank, which had a vertical height of about 35 feet—the formation being mineral-stained with the colors of green, blue and red. Silver was also seen spotting the rocks as chlorides and sulphides. The prospectors were sure that they had discovered another Comstock. They followed the bed of the canyon to a point where it had bisected the lode, when was seen on the opposite side, near this point, a strong spring of pure water flowing from a crevice on the west bank. The party came to camp, unloaded their jacks, cooked and ate their frugal repast, spread their blankets, and slept the sleep of the just, dreaming of marble palaces with silver walls and golden pavements. In the morning, both mines and water were located, and in 1862 a small mill was put up for working the ores.

Not long after, the Indians burned the mill and killed the men, causing the camp to be abandoned. Troops were sent from Mojave Station, but the Indians had already made good their escape. The mine lay idle till 1873, when but carries a low-grade ore. It could probably be worked with profit if fuel could be cheaply obtained and a plant could be had sufficiently large to handle it in quantity.

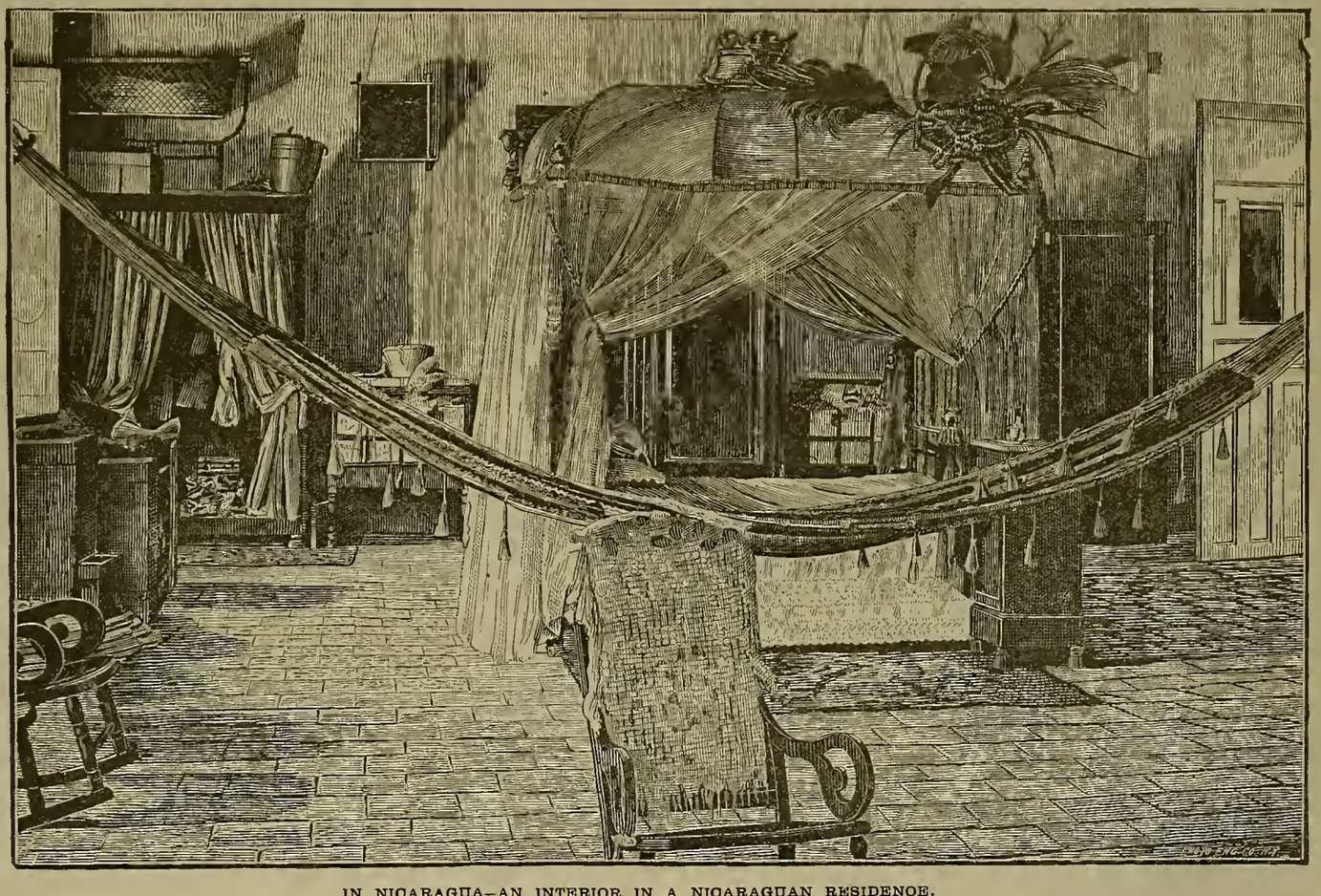
The Montezuma is a strong vein, carrying an abundance of ore rich in silver, galena and carbonates of lead. Though but little developed, the camp possesses every facility for economical workings—wood (nut pine and juniper) being abundant, with water sufficient for all practical purposes. The water level is reached at a depth of from 300 to 400 feet. Elevation 5000 feet above tidewater; distance from A. & P. R. R., 30 miles, over a natural highway of easy grade.

(To be Continued.)

In Nicaragua.

The course of events apparently justifies anticipations of the realization of the interoceanic canal enterprise via Lake Nicaragua. In his message to Congress the President says: "The Nicaragua canal project, under the control of our citizens, is making most encouraging progress, all the preliminary conditions and initial operations having been completed within the specified time."

The progress of the enterprise adds new interest to scenes representing the locality through



IN NICARAGUA—AN INTERIOR IN A NICARAGUAN RESIDENCE.

which the canal will pass and the life of the citizens of the country which will thus become commercially one of our nearest neighbors. Having on former occasions, when speaking of this country, produced in the Press cuts illustrating the scenery along the route of this great interoceanic water-way, we present herewith an interior view of one of the better class of Nicaragua dwellings, the equipment of which, as will be seen, does not differ widely from that found in most of our northern homes.

But, besides a certain tropical air about the apartment and its outfit, there will be observed suspended across it the ever-present hammock, found in all warm countries, more especially in those inhabited by peoples of Spanish origin. This style of couch, which corresponds in its uses, at least, to our easy-chair or lounge, is in these countries seen everywhere—in the mansions of the rich and the huts of the peons alike, it being in these hanging and gently swaying beds that all take their siesta or midday sleep. More often they are suspended in the veranda than in the interior of the dwelling, as shown in the cut. These hammocks, woven from strong cords, are often very tasty affairs, being dyed with many bright colors and adorned with fringes, tassels and the like.

yielded since their discovery bullion to the value of about $2,500,000. The greatest depth attained is 250 feet, with a longitudinal extent of 1200 feet. These mines have been self-sustaining from the start and are at this time in bonanza.

The Lizzie Bullock is a southeasterly extension of the Monitor; the vein is from a mere seam to four feet in thickness, ore values from 150 to 2000 ounces per ton; coin values extracted about $1,200,000. It is developed by a shaft 400 feet deep and two tunnels—one 250 feet and the other 845 feet long. The mine has been worked steadily since its discovery in 1870. The Alley mine, which adjoins the Lizzie Bullock on the north, has also been a large producer. It is developed by a tunnel 400 feet long which gives 100 feet of backs. The assay value of the ores varies from 300 to 4400 ounces per ton; $100,000 have been paid in dividends. The ores work in the free way up to 95 per cent of their assay value. This mine has paid larger proportionate dividends to the amount expended than any other in the district. The two last-named mines, and a 10-stamp-mill in which the ores have been worked, belong to J. A. Bidwell.

The Eugenia has been opened by a tunnel 100 feet in length; ores rich but spotted.

The Snowstorm is situated half a mile north of the Beatrice and on the contact ledge; prominent croppings between incasing walls six feet; gangue free-milling quartz averaging $300 per ton. But little work has been done on this vein, and none for a number of years past.

The Stonewall mine of the same group and date of discovery, is an easterly extension of intrinsic merit, has been worked with but little energy. Preparations are now being made, however, to work it in a more energetic way.

Bullion District.

Lies seven miles southeast of Nantan. It contains a number of promising veins carrying ores of both silver and gold. But little work has as yet been done here.

New York District.

Is situated in the northeastern portion of San Bernardino county and about 20 miles east of Clark mountain. It is one of the oldest mining districts in the county and has attracted considerable attention—the mountain in which the district is located being a marked feature in the landscape.

Shortly after the excitement that followed the discovery of the Comstock lode, the whole country west of the Rocky mountains swarmed with prospectors in search of its counterpart. At that time impecunious frontiersmen and prospectors could easily obtain costly prospecting outfits from prosperous traders and merchants for a share in their discoveries and locations—it being considered a good investment. The desert region of San Bernardino county was, with other localities, visited by these adventurers. New York mountain presented an attractive field, as it bore the earmarks of mineral wealth. Its mountain slopes were covered with nut pine and cedar. Strong evidences of the existence of water in the range were visible. In 1861, a party of prospectors who had been ranging eastward from Death valley entered this mountain by a broad ravine it was sold to Messrs. Winchester & Co. of Elgin, Ill., who opened it and built a mill containing a Whelply-Storer pulverizer and two pans. The ore proving rebellious, the mill was closed down and has remained idle since.

The veins here crop boldly to a hight of from 10 to 40 feet and hold for considerable distances on their line of strike. They are well mineralized, show every evidence of value, and range from six to eight feet in width. They occur in a quartzose gangue, the ores being argentiferous and carrying the bases of copper, lead and silver; assay values from 40 to 100 ounces per ton. The core of the mountain ranges here is syenitic, flanked by lime and porphyry, the veins usually occurring on the contact.

The Gladiator, one of the most prominent veins of the district, crops boldly for a distance of three miles with a N. W. and S. E. strike. This mine has been developed to a vertical depth of 300 feet, showing a well-defined ledge carrying smooth and perfect walls standing nearly vertical. The ore is reported to have averaged 100 ounces per ton.

The Highlander is a companion vein lying in the vicinity of the Gladiator, carrying ores of the same general character—free where oxidized above the water level and base as soon as water is reached. To successfully treat these ores, dry crushing and chloridizing furnaces are necessary.

The Belfast lode adjoining and running parallel with the Highlander, carries a large body of base ore, being contaminated with antimony, arsenic and sulphur. The most of this ore is low grade.

The Texan is a well-defined and strong vein,

The New Alloy discovered by Keith of Brokenheim, Germany, is claimed to practically resist the attacks of most acids and alkaline solutions, and may therefore be very advantageously used in the laboratory to replace vessels of ehonite, vulcanite or porcelain. It is composed of 15 parts copper, 2.34 parts tin, 1.82 parts lead and one part antimony.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

AT SUTTER'S CREEK.—*Ledger*, Dec. 6: Developments still continue to improve as they open up. At the North Star the veins continue to widen and the rock is rich. They have already about 30 tons hoisted to the surface. It will be some time yet before they will be able to give the extent of the vein, but it has every appearance of a permanent and well-defined ledge. At the Rose mine they have not cut through the vein yet, but have passed through sufficient to convince them that there is a large amount of quartz, and so far it is of a paying character.

ALONG THE MOTHER LODE.—Twenty stamps of the New London are kept running. This is only one-half the capacity of the mill. It is reported that the Plymouth Con. will resume crushing shortly on ore from the small vein of rich quartz recently discovered. Ten stamps of the mill of the Amador gold mine have been running for several days on rock from the Doyle mine in Hunt's gulch. Crushing was brought to a temporary standstill Thursday by the breaking of the reservoir. So far 100 tons have been passed through, and from the appearance of the plates and batteries the millman, John Delzell, estimates a yield of $3 per ton. While this is low-grade ore, situated as this claim is for economic working and with the large ore bodies in sight, it leaves a good margin of profit. It may be said to be surface rock, as the quartz is taken from a tunnel less than 100 feet from the grass roots. The intention is to put through about 1000 tons so as to get a thorough test of the paying quality of the ore. At the Gover everything is running in good shape and lively times are expected in the future. There is a large supply of 14-inch square spruce timbers on the ground, as the company is going down to the 1000-foot level and will retimber the shaft as they go. The bottom of the shaft has not been seen for 13 years. After the water is taken out the company will commence sinking with the intention of going 300 feet deeper at once. The mill is kept running from the 600-foot level, which is a very good proposition. The pumps have arrived and are being placed in the mine. A large dam has been constructed at the 400-foot level, and a large room made in the hanging-wall so as to keep the pumps clear of the shaft, the largest weighing five tons and the smallest four tons; capacity, 200,000 gallons per 24 hours. Very simple in their construction, they are very fine pieces of machinery and will require but a minimum amount of attention. Electric dynamo is situated at the mill which will generate the power by three copper wires to be transmitted to the motors connected with the pumps at the mine. Dynamo is to be run by Pelton wheel, with Hyde governor and governing nozzle adjusting the gate and water on wheel to amount of horse-power to be generated by the dynamo. Dynamo capable of generating 15-horse power or one-horse power, and the Hyde governor regulates the water accordingly. This same dynamo will be capable of running their hoisting works and will be used in lighting their mill and mine. They have duplicate parts of their dynamos and motors. Shaft as far as the water line, 600 feet, has been retimbered and new track laid.

Calaveras.

SHEEP RANCH.—*Chronicle*, Dec. 6: The Sheep Ranch mine is in active working operation and is still producing its never-failing output of bullion. The mine is now at a depth of 1100 feet and heavier machinery will soon be erected, as the owners propose to commence further sinking. Over 70 men are employed in working this property, and as many more in supplying timber and wood for the mine. A yearly run consumes over 5000 cords of wood. The Wood mine, three-quarters of a mile from town, is a new property recently opened up and controlled by an English company. Teamsters are busily engaged in hauling ore to the mill, which is run by water-power, and everything points to another successful mine being discovered in that section of our county.

Butte.

OPERATIONS AT THE GOLDEN GATE MINE.—*Union*, Dec. 3: The operations of the Golden Gate mine, at Oroville, in turning the waters of Feather river, in order to work the bed of the stream for its golden treasures, have engaged much attention, owing to the magnitude of the enterprise, as it is the greatest of the kind ever undertaken in California, and it is expected that the claim will not yield less than $1,500,000. A trainload of excursionists went from Marysville to Oroville the other day especially to see the mining works, and the following brief description is given by the *Appeal*, of the way in which the operations are conducted: The main flume, through which the river is carried, is about 30 feet wide and four feet high, and the water rushes through with tremendous velocity. Much engineering skill was required to build this flume, as the lay of the river-bed is very uneven. It is substantially constructed, and is calculated to withstand the high waters in the winter. The dam is provided with several gates, which may be opened to allow the river to follow the channel. A very novel and interesting feature of the mine is the river's being made to do its own work. Every few hundred feet a large water-wheel is built over the main flume and is driven by the swiftly flowing water. The power thus generated is transmitted by means of wire cables to pumps or elevators, by means of which the seepage from the dam is raised and emptied into a smaller flume. This, in turn, is made to run still more elevators, so that a complete system of river draining is had. As one gazes upon this vast enterprise, he cannot but marvel at the great things which large corporations can accomplish, and the indomitable energy and courage men must have to undertake such a scheme, fraught with so many difficulties and uncertainties and requiring such an outlay of capital. Hundreds of men are at work with pick and shovel, and to see the old-fashioned rockers separating the dust from the gravel and sand, brings to mind very forcibly stories of the "days of '49." The mine is provided with electric lights, and is kept in operation day and night. This has been a most favorable season, and the owners are very certainly improving the dry weather by "making hay while the sun shines." As soon as the rains begin, operations will cease, as the river will be covered.

WILL DRIFT THEIR GROUND.—*Register*, Dec. 6: The Spring Valley Co., having given up working their ground at Cherokee by the hydraulic method, will now commence crushing the auriferous cement, for which purpose they have an abundance of water. This idea for obtaining gold from the hardpan or cement opens a new source of wealth in this State and one that promises to last for many years. The quantity of gold-bearing cement is almost unlimited California, and this will continue to be worked for many years. The cement is blasted and then crushed like quartz rock. It is then run through an arastra and ground up into fine powder. While the returns are not large, they are certain, and the amount of gold obtained pays well for the labor of obtaining it.

Napa.

CINNABAR MINING DISTRICT. — *Calistogian*, Dec. 3: The Georgia quicksilver mine, located three miles east of Pine Flat, is attracting much attention, and if reports are true it will become a paying property. It is not new ground entirely, but the claim under a different name was prospected years ago, at which time some quicksilver was extracted from it and taken to retorts on another claim. The result of this trial was not entirely satisfactory, though considerable metal was found. The vein recently discovered is reported to be two feet wide. Several specimens of very rich ore are being exhibited about town and the excitement begins to assume proportions similar to that of a few years ago, when the Pine Flat leads were first discovered. The Pine Flat district, or more properly speaking, the Cinnabar Mining district—is a wonderful section of country as regards its strong indications of the presence of quicksilver. No one goes over the district without expressing the opinion that valuable quicksilver mines will finally be opened there. The large amount of float cinnabar found at very numerous places can lead to no other conclusion; but the immense amount of money expended in the district has not thus far resulted in opening a mine of value. There are promising claims, however, and the best of them are the Georgia and Black Bear, the latter being owned in part by Calistogians. On these properties there is sufficient to base hopes that Cinnabar district will yet come to the front as a valuable producer of quicksilver; for with actual proof in two mines that quicksilver can be mined there in paying quantities, prospecting will be engaged in from time to time and will probably result in opening other profitable mines.

Nevada.

NEW MINING ENTERPRISE.—*Transcript*, Dec. 4: A. Isoard and R. C. Walrath have put men at work to develop the West Harmony drift mining claim. The shaft which was put down to a depth of 100 feet some years ago, and which has since caved somewhat, is to be deepened. This shaft is 1000 feet west of the shaft of the Harmony company's claim where a rich strike was recently made.

Placer.

TUNNEL FINISHED.—*Republican*, Dec. 6: The tunnel at the Gray Eagle mine is completed and was accepted by the company last Friday. It is 2500 feet long and will be extended 100 feet farther before an upraise is made.

KING'S HILL MINING CO.—*Republican*, Dec. 7: This property, under the management of Thomas B. Everett, is situated on the Iowa Hill divide, about three miles from the town of Iowa Hill, between Big Indian and Shirt Tail canyons, in one of the richest mining sections in the State. The company have title to 640 acres, nearly all of which prospects well in placer gold, enough so that it is expected to give large returns when the plant is in operation. Preparations are now being made for active work as soon as the plant, which consists of the Freeman dry process, can be procured. This plant has been tested upon the ground to the satisfaction of all parties interested.

Plumas.

DRIFT DEPOSITS.—*National*, Dec. 6: The mining prospects and recent developments in Plumas county are very encouraging and promise some large returns in the near future. Between Gibsonville and LaPorte the Scotch Co. has just completed the largest and finest mining shaft known in Northern California, and it has a very large lead or channel of blue gravel that has the appearance of being exceedingly rich. The company works its mine by drifting and raising only the pay gravel, and it has every convenience and all the modern improvements for working the mine and saving the gold, and the example set by it will be followed by other companies who have valuable mines and who have been tied up by injunctions or by fear of them.

San Bernardino.

STRUCK COAL.—Riverside *Bee*, Dec. 4: J. H. Beaulieu reports striking a good vein of coal in one of the canyons leading up from the Santa Ana river to the southeast. He had a sample of it in town, and it was exceedingly good coal. He says the vein is large and thick, and lies high up on the mountain on Government land near the line of the Santiago grant. There is no question about coal being in the mountains south of town, of good quality and unlimited quantity, and some lucky individual or company will strike it rich one of these days.

San Diego.

MANGANESE DEPOSITS.—*Union*, Dec. 4: A party who has been looking after manganese in this State is about to begin shipping this ore to Pennsylvania manufacturers who are compelled to use this mineral in making steel. The manganese deposits in the East have become so nearly exhausted (the largest beds being near Hot Springs, Ark.), that the manufacturers have become alarmed. They have had agents looking all over the country east of the Rockies, and even in Northern Mexico, to find other deposits but without success. Then it was that the Californian, whose home is in San Diego, wrote to inform the manufacturers that the Golden State possessed manganese of remarkable purity and in vast quantities, especially in the central portion of the State, and that it is as accessible as iron ores. Another thing which is turning the attention of Eastern capitalists to this section is that San Diego, San Bernardino and Los Angeles counties all contain the mineral to a greater or less extent.

Shasta.

MINING ACTIVE.—*Free Press*, Dec. 7: There is more life and activity in mining at the present time in the mining districts of Shasta than has been manifested for a long while. One of Frank Wheeler's boys has found a 3-foot ledge on the east side of Clear creek, a mile north of French gulch, which he traced down to the creek to a point where the placer mining quit paying, and there is to be seen a large sulphuret ledge under the water crossing the stream in a northeast and southwest course. This is on a direct line with all the paying mines of that section.

TUNNELS BEING RUN.—In the Carter & Coyle mine at Delta, a tunnel has been run 300 feet long tapping a 4-foot ledge, rich in free gold and sulphurets, 120 feet below the earth's crust. The ore averages about $65 to the ton. The ground is leveled for a new 10-stamp mill and all the machinery is on the ground. Tom Foster is down from his claim on Spring creek. About the middle of the summer he struck a rich prospect on the north side of Spring creek, about a mile above its mouth, and is now running a tunnel to tap the vein about 150 feet deep. The vein is a strong one, and prospects on the surface for 1000 feet,

Siskiyou.

FROM THE MINES.—Yreka *Journal*, Dec. 3: The river-miners at the Klamath are all busy just now hoisting rich pay gravel, and will continue operations day and night until washed out by winter freshets, or the weather becomes so cold as to freeze the ground and sluice water. The weather seldom gets cold enough to prevent digging in the bottom of the pits where the gold is found in greatest quantity, but sometimes freezes the ground near the surface, causing the large bowlders to become loose and dangerous as the hot sun during the middle of the day thaws out the ground and lets the heavy bowlders drop out. Great preparations are being made to continue work all winter in the cinnabar mines on the west branch of Beaver creek, some 15 or 16 miles from Virginia Bar. The requisite furnaces are now being packed there from Cole's station before the storms commence, together with a sawmill. At least a dozen men will be employed all winter, and when the furnaces and necessary houses are completed, the work can be carried on all winter, no matter how deep the snow covers the ground, as their work is all under ground in securing the ore. The company consists of a number of San Francisco and New York capitalists, who intend working the ledges of Beaver creek on an extensive scale.

BLUE GRAVEL.—*Telegram*, Dec. 6: W. Huntley Hampton, of Portland, Oregon, an assayer and mining engineer, who is also the United States Commissioner on mines and mining for the States of Oregon and Washington, was in the city this week accompanied by R. Gilham of Henley. They were here for the purpose of examining into our mines. Mr. Hampton informs us that Siskiyou's future lies in blue gravel, and that he has yet to see anything finer than the blue gravel which has been discovered on Greenboro about 2½ miles west of Yreka. He says that it is identical with that found at Henley, and that inside of 18 months it will have been proven one of the greatest bonanzas ever known in Siskiyou county. Mr. Gilham says that the miners have only been getting "skim" milk, but that now they will get some of the cream.

Sonoma.

QUICKSILVER.—*Enterprise*, Dec. 6: The Georgia mines at Pine Flat yield quicksilver and it is believed that the ore will prove extremely rich. A specimen now at the Sotoyome House contains 90 per cent quicksilver, and D. Lavadiere, representing an English syndicate, has offered $100,000 for the mines if a two-foot bed of ore is uncovered. In the spring the company will erect a smelter.

Trinity.

CANYON CREEK MINES.—*Journal*, Dec. 6: The coming winter will show more concerning these mines than has yet been ascertained. With two mills in operation the ore can be subjected to the only correct test—a mill test. It is the opinion of all acquainted with the country that Canyon Creek has a bright future and in a short time will rank with the best camps of Northern California. W. D. Everhart, one of the owners of the Globe mine, showed us this week the results of an assay on 17 pounds of ore taken from the mine. The rock went $163.09 in free gold to the ton and the concentrates $2810.34 to the ton.

Tuolumne.

LUNDY CAMP.—*Independent*, Dec. 7: Quite as many miners will be employed in Lundy this winter as in Bodie, and twice as many next summer.

MINING ITEMS.—*Independent*, Dec. 8: The storm has called a halt in the work of erecting machinery on the Van mine. Supt. Tischer will not be long in getting the works under cover when it clears up. The miners are hard at work since the rain commenced. The new machinery for the Pacific has nearly all arrived and been put in place, now being in working order. The new air-compressor, of 80-horse power, was expected this week. When that is in place the mine will be in complete trim for heavy work, which will be pushed vigorously. The Little Gem, a promising mining property situated two miles south of Sonora, beyond Murnan's place, and owned by C. E. Street, J. D. Barry and L. Escullachio, will quite likely be sold in the near future. We understand that San Francisco parties are after it, and also some of our local mining speculators. The mine is comparatively undeveloped, there only being a shaft to the depth of 105 feet on the property. However, a test recently made of the ore of this mine convinced the owners that they were the possessors of a valuable mine. A short time ago five tons of ore were treated at the Maltman chlorination works and gave $3 per ton in free gold and $5.25 in sulphurets.

Yuba.

DRIFT GRAVEL.—*Telegraph*, Dec. 6: In the Ayer drift gravel mine at Mooney Flat they have struck a vein of incalculable value 50 feet wide by 15 feet high. These dimensions are absolute and there are indications that it is much more extensive. The gravel from this discovery is very rich, yielding $4 per ton. All of the gravel so far taken out averages, by actual figures, $3 per carload, and any gravel miner knows what that means. Old Mooney Flat and Smartsville are entering upon a prosperous career and by and by Timbuctoo will fall into line.

COPPER PROSPECTS. — Twenty-five years ago there was a great deal of activity in the development of copper mines in this county and some promising ledges were found and worked to a considerable extent. One company, known as the Yuba Copper M. Co., expended over $8000 while working its claim and developed a good-sized ledge of copper ore that would produce, in a working test, from 12 to 25 per cent of pure copper. At the works of that company, which were located in the foothills 14 miles from this city, the ledge was prospected to the depth of about 180 feet and found to be of good size and average quality all the way down, and there was a large quantity of ore raised and some shipped to Swansea in South Wales, where a thorough test was made by a smelting process, which was considered at that time the only correct method of reducing such ore. The product of the mine was known as Peacock ore and required to be roasted thoroughly to extract the copper from it, and, as there were no reduction works of this kind then in operation in this State, and as it would require a large sum of money to build the works, and the profit on the copper product small, it was resolved to abandon the claim for the time being, which was accordingly done, and the buildings and machinery were sold. There is also a copper ledge running nearly north and south from near the Empire ranch in the direction of Speoceville, and which has the appearance of being the same class of ore as that found at the Spenceville works. Under the developments made in this class of ore and the successful working of it of late, we believe the ledges named can be made a profitable investment for capital.

NEVADA.

Washoe District.

ON THE COMSTOCK. — *Territorial Enterprise*, Dec. 5: The past season's mining operations upon the Comstock lode have been marked by steady, energetic, economical, persevering and intelligent prospecting work. More work has been done at a smaller expenditure of money than ever before known in the history of mining in Nevada, and a heavy and steady reduction of ore has been the result. The bullion-producers have also been greater in number. They were as follows: Alta, Justice, Overman, Kentuck, Crown Point, Belcher, Challenge, Yellow Jacket, Confidence, Imperial, Occidental, Chollar, Hale & Norcross, Savage, Gould & Curry, Con. Cal. & Va., Ophir, Monte Cristo and some small claims. Silver City, though hampered by ruinous litigation, has produced a goodly quantity of ore, of which profits were realized. Since the snow cleared last spring the mills of the Comstock have reduced on an average about 6000 tons of ore weekly, and in the neighborhood of 2500 tons of slimes and concentrates, and nearly 1300 men have been steadily employed. The profits in mining have been small, but this is due in great part to the extensive prospecting work that has been carried on in all the mines in the endeavor to uncover ore to keep the mills running. It is also accounted for in part by the low grade of the ore. The work in the Con. Cal. & Va. to keep the mills supplied with ore has been simply stupendous, considering the difficulties encountered in extracting it. The ore in that mine, as is well known, comes from the old bonanza workings, the stopes of which burned for several years. It is extracted right from among the timbers in many places, and drifts are run in solid wood oftentimes to get at it, and it has to be picked and sorted from the charred wood and chips and timber, as that character of material does not amalgamate. Nevertheless, the grand old mine yielded over 200 tons of ore daily during the season. A lower level is now being opened in this mine, and there is every prospect that by the beginning of next season the mine will be in condition again to supply the mills. A mine is like a farm, and the winter-time is the time to cultivate it for the summer thrashing. At the Savage a lower level is being opened, and they are already in ore on the downward continuation of the body of ore found eastward of all former workings on the 1200 level. But this mine will also need considerable prospecting work during the winter to put it in condition to yield ore the next season. There is a fair prospect that Alpha and Exchequer will be added to the list of bullion-producers next season. More prospecting work must be done in Yellow Jacket, Crown Point, Belcher, Confidence, Challenge and Imperial to make them yield pay ore next season, but they may be fairly relied upon to do so. Kentuck, Justice, Overman, Alta and Occidental will in all probability be on the list of bullion-producers in 1891. Ophir, Mexican, Union and Sierra Nevada always form an interesting quartet toward which the eyes of this community are longingly turned. A strike of ore in any one of these four would do an immense amount of good to the business of mining here. Gould & Curry, Hale & Norcross, Potosi and Chollar will probably yield ore next year, and Potosi has a chance of being a king-pin. The mining work west of the Con. Cal. & Va., in the Andes and West Con. Va., attracts more or less interest, as it is believed that ore there will yet be found in paying quantities. There is a hope entertained that work will be resumed in the Hendricks at the north end, and also in the Scorpion and East Sierra Nevada. The mining litigation in Silver City is on the eve of settlement, after which work may be expected to be resumed in all the principal mines in that district. The mining properties of Silver City pay their own way. On reviewing the entire situation the *Enterprise* believes that next year will be a fair year, though not as active as the past. But for the next four months or more it is idle for men who now find themselves with the profits of last year, to think of eating them up here and perhaps run heavily in debt before the active resumption of mining and milling operations. Farmers do not employ a full force of men the year round, and neither can mines be expected to do so.

ARIZONA.

MINING NOTES.—Mohave *Miner*, Nov. 29: Jamison & Sample shipped a carload from the Rip Van Winkle. The Empire mine is making a bigger show than ever. There is now two feet of ruby and native silver in sight, and the Empire is probably the best mine in Mohave county. J. K. Mackenzie has leased the Cupel mine and is making preparations to start work on the property at an early date. The Hopeful mine in Todd Basin is the property of Thos. P. Roberts. The ledge is uncovered for a distance of over 700 feet, showing an ore streak from 16 to 24 inches in width, which assays from $50 to $175 per ton in gold and silver the entire length. It is considered by miners to be the best showing made in this section for some time. The following shipments of ore were made from the Kingman Sam-

pling works this week: Richard Gorman of Fenner, 1 carload; Barnet Bros., from the C. O. D., 1 carload; James Cadden, 3 tons from the north extension Diana; Darden & Gilliland and Barney McCall, lessees on the Empire mine, each a carload; Brady & Burch, 5 tons from the Cedar district.

FROM CHLORIDE.—Robt. Mera and Jos. Waggoner are doing the assessment work on the Silver Hill claim. A. E. Rogers has leased the interest of J. P. Finegan in the Homestake claim, and together with James Uncopher will work the claim. H. P. Ewing and Louis Hemriod are working the Tuckaho. They will do some experimental leaching on the ore from that claim. C. E. Sherman is now working several men running a tunnel on the Independence mine. J. P. Finegan has struck a rich ledge a few yards north of his residence, and it looks as if it would be the richest mine in this section. Johnson & Schemelpfennig are working a lead claim which is paying them handsomely. A. E. Rogers recently took out a small pocket of rich ore from the Nigger Baby. It assayed something over $2000 per ton.

BRITISH COLUMBIA.

CARIBOO MINES.—Kamloops *Inland Sentinel*, Nov. 29: It looks at the present time as if a new golden era of prosperity is about to dawn upon old Cariboo, by the extensive development of her hitherto partially developed diggings and also vast deposits of auriferous earth that has never been worked before. The Victoria Hydraulic Company has located a claim on the South Fork of the Quesnelle river, about a mile from the confluence of the North and South Forks, extending up the river on either side for one mile. On this property Mr. Hepburn has been prospecting and preparing for extensive operations next spring. He has ascertained that the pay streak is about 300 yards wide, in the bed of a stream which in ages past ran in a course about parallel with the South Fork. It is about 100 feet above the river, and in places is fully 100 feet deep. This earth Mr. Hepburn is convinced will yield about $1 per yard. The company have rights for 4000 inches of water, and a ditch will be run some 16 miles next spring, the water from which, run through a 9-inch nozzle, will displace 4000 cubic yards daily. This hydraulic power will eventually be increased fourfold.

ROCK CREEK.—The Laura hydraulic mine on Rock Creek was closed down on account of freezing weather on November 6th. The claim lies on Rock Creek, about four miles from the boundary line between British Columbia and the United States. Rock Creek, rising in an eastern spur of the Cascades, traverses 30 miles of very varied country, and then pouring its turbid stream into the Kettle river, flows on to the Columbia. The claim which Mr. Jensen manages extends along the line of the creek 1½ miles, embracing 500 feet on each side. Two years ago work was started on it and the sawmill and hydraulic plant erected. The gold all lies in alluvial deposits on the banks, 80 to 90 feet high, on each side of the creek. The hydraulic power is taken from the creek itself and has a pressure of 85 feet fall. This throws a five-inch stream from the nozzle of the pipe with a force which cannot be conceived without being looked upon. It washes away the gravel and rends the huge rocks from their beds with a mighty power which shakes the solid earth. This stream has been digging and tearing away the banks continuously since April 24th, and the amount of pay dirt washed into the flumes and hoxes would seem incredible were it estimated in cartloads. Despite the fact that a vast deal of machinery and work, including 27 new boxes and a large amount of fluming, has been put in the mine this year, it has not only paid expenses but turned out an overplus. This means that next year—when no more work of this kind will occur, to reduce the profits—a very handsome return will be realized. Even as it is, it is claimed that the output of gold from this claim has been larger during the past season than that of any other in this province. Mr. Jensen is an enthusiast on the subject of hydraulic mining. He has been more or less connected with it all his life, and his opinion as an expert is entitled to due consideration. No country on the face of the earth, he says, is better adapted or more fitted for mining development by hydraulic means than are the gold-fields of British Columbia. This wonderful power is rarely utilized now, even when it is most obviously at hand and applicable, and he expects in the near future to see a revolution from the present methods to that of the one he deems so readily available.

LOWER CALIFORNIA.

CERROS ISLAND.—National City *Record*, Dec. 4: The past year has been one of important developments in mining in this part of the country. There is not the slightest doubt that on the peninsula of Lower California great mines of rich ore still await the touch of the prospectors' tools to spring into being. That part of Mexico is still comparatively unexplored and its secrets when laid bare by careful investigation will show much that will be of the highest interest to those who have the energy to take advantage of them. The peninsula is still a *terra incognita* and in its mountains and valleys it is the firm belief of competent men that rich mines will yet be uncovered. One strong argument for this is the results which have followed the development of the mines on Cerros Island. It is now about one year since operations were begun on the island and that time has witnessed important changes. The company has little to say about the richness of the ore and how it pays—that of course is their business, but the fact that extensive improvements are now being made and others are contemplated shows that there is a good foundation for such investments. Cerros Island lies off the coast of the peninsula, 311 miles from San Diego, an island about 20 miles long and from 10 to 15 miles broad. It lies at an oblique angle with the mainland, extending out into the ocean and distant at its nearest point about 10 miles. It is very rocky and in places precipitous. The mines are some distance from the landing place. Since their discovery a fine wagon-road has been constructed at a cost of about $10,000. In the last few months many buildings have been erected. Among these are officers' quarters, houses for the men, grocery store, blacksmith shop, storehouses, and others. Seventy men are now at work there, practically all being American miners. There is a spring of fresh water on the island which many make use of. For those who do not like it, water is carried down from San Diego. Three tunnels are now being run into the mountain where the main body of ore is supposed to lie. One of these is already over 400 feet in length and is provided with tracks on which ore cars are run. To transport this ore to San Diego, the company formerly made use of numerous small craft. Then it chartered the Carlos Pacheco, which also proved to be too limited in capacity, and now the Karluck has been chartered. This vessel is a steam brigantine and carries 350 tons of ore. It is expected she will make at least three and possibly four trips a month. She is well fitted to accommodate a limited number of passengers and on her first trip carried her full quota, 16. A good many persons visit the island out of curiosity to know what the company is doing. It holds the exclusive right from the Mexican Government to mine on the island for the next ten years. Three qualities of ore are taken from the mines. One is shipped to Pueblo, another only to San Diego and the third undergoes treatment on the island. From this brief statement it is plain that the Cerros Island Mining Co. is doing an important work and is a growing factor in the prosperity of the bay region.

COLORADO.

GENERAL MINING NEWS.—Aspen *Times*, Dec. 4: A most promising discovery has been made in the Castle No. 2, in the territory under lease from the Park Consolidated Mining Co. to Messrs. Howe and Tourtelotte. The particulars of the strike were not obtainable last evening, but it was learned that the work had been in good ore for ten feet. The development had not been continued far enough to show the dimensions of the ore body, but it was thought by the *Times* informant that a valuable chute had been opened.

LITTLE RULE STRIKE.—A very important strike is reported from the Little Rule. When the Driver upraise was being run a streak of very rich lead ore was encountered. Specimens taken out were declared to be the finest ever brought from that part of the mountain, but the ore was not found in sufficient quantity to give the strike any particular importance. Now the same streak has been opened in the south level, which is much deeper, and the ore is even richer than it was above, while the body is much larger. The streak is 2½ feet thick, according to the statements of those who have inspected the strike, and is solid. Assays show that the ore carries 58 per cent of lead and 258 ounces of silver per ton. In addition to this, the upper south level has developed four feet of 50-ounce ore that constantly improves as work progresses upon it. Altogether, the outlook for the Rule is exceedingly bright.

ORE SHIPMENTS.—The following are the ore shipments for the week ending Friday, November 28, 1890: To Denver, 1664 tons; Leadville, 704 tons; Pueblo, 251 tons; total, 2619 tons.

IDAHO.

OWYHEE NOTES.—*Statesman*, Dec. 7: In the Trade Dollar mine, owned by W. H. Dewey, to tap which he has run a tunnel during the last ten months, a distance of 437 feet, a large and rich body of ore has been struck. The ledge where cut by the tunnel is 21 feet wide, and in the face of the drift there is 10 inches which assays 4600 ounces in silver and $707 in gold, also four and a half feet which assays 577 ounces in silver and $12 in gold, and another part of two feet wide assaying 266 ounces of silver and $12 in gold. The tunnel at this place is about 250 feet from the surface. The ore shows in face of drift and in the top and bottom of the tunnel. In the Black Bart, another claim owned by Mr. Dewey and lying alongside of the Trade Dollar, in which a tunnel has been run 160 feet, ore has been struck which assays 69 ounces in silver and $10 in gold. Mr. Dewey has five claims adjoining each other in this place, making 3000 feet long and on one end 1800 feet wide and on the other end 1200 feet wide. He is now starting to take out ore and says by the first of January he will have out enough to repay him for what he has paid out for prospecting the five claims the past year. Messrs. Sullivan and Phillips have just returned from Boise, where they had taken over $12,000 worth of bullion. On Cow creek in this county, rich silver ore was struck by Wellinigger Bros. It will assay about $300 per ton. The deposit where struck is loose and the boys are sinking on it in hopes to find a solid ledge.

NEW MEXICO.

NEW CONCENTRATOR.—Black Range *Chloride*, Nov. 28: The new 50-ton concentrator will be running to its full capacity in a few days. It is the intention of the Chloride Mining and Reduction Co. to keep the mill running day and night upon ore from its own mines, and should the mill's capacity prove insufficient to handle the output of ore, the capacity of the mill will be immediately doubled.

A NEW INDUSTRY.—The turquoise mines of Grant county seem likely to become important producers before long. Prominent jewelers and others in the United States have been corresponding with the owners of the properties here, proposing to take the whole output of the claims.

OREGON.

PINE CREEK MINES.—*Bedrock*, Dec. 5: The Oregon Gold Mining Co. is running its 20-stamp mill night and day, treating 45 tons of ore every 24 hours up to 85 per cent of the assay value of the ore, besides saving two and one-half tons of sulphurets per day, that will average $150 to the ton. The ore is from the Red Jacket, and the company estimates that there is sufficient ore in sight to keep the mill running constantly for the next 12 months. The company has just finished a roaster of eight tons capacity for the purpose of reducing the sulphurets, thus doing away with the necessity of shipping to Denver or Salt Lake. Under the present management, the Oregon Gold Mining Co. is more successful than ever before and the camp is in a more prosperous condition than ever. The Huntington mill recently erected by Davis & Howard on the Union mine, is treating from five to six tons of ore per day up to 90 per cent. In the trial test of 25 tons, average ore, the mill saved $35 to the ton — $10 free gold; $25 in sulphurets. The Davis & Howard mill also treated several tons of ore from the Last Chance mine, owned by Carey & Howard, with satisfactory results. All development work done shows a good outlook for the camp, and more confidence is expressed than ever before. The failures in the past can be attributed to mistakes in the treatment of the ores.

SOUTH DAKOTA.

URANIUM.—Deadwood *Pioneer*, Dec. 1: Prof. Lengfeld, in his visit to Ruby Basin yesterday, secured some samples of uranium slate from the Ross-Hannibal, which he proposes to take to the school and analyze. Should the metal prove uranium, it is valuable, as $80,000 worth is annually used in the United States for making uranium glass and preparing paints.

PORTLAND.—A new body of ore was opened on the Portland yesterday. The vein is three feet wide and gives an average assay of $35 per ton. The strike was made on the Bristol, a claim adjoining the Trojan.

SQUAW CREEK.—This district is undeveloped, although it has been thoroughly prospected by Frank Bryant. For a distance of 1000 feet along the creek the outcroppings of dry ore can be easily followed, much of which assays from $10 to $30 a ton in gold and silver. In some places the developments would seem to indicate that this dry ore is a vertical vein passing through the quartzite.

UTAH.

FROM THE MINES.—*Journal*, Dec. 7: The Keystone mine at Eureka shipped six carloads of high-grade ore last week. The Eureka Hill has resumed ore shipments now that silver has advanced again in price. One hundred and forty-two tons of Anchor concentrates and 7 tons of Ada ore came in this morning. McCornick & Co. received yesterday: Hanauer bullion, $7350; silver and lead ores, $5500; total, $12,850. T. R. Jones & Co. received yesterday: Silver bars, $6100; selected lead, $1150; silver and lead ores, $2010; total, $9260. Prof. Keel came in last night from Bingham and reports that there is a great deal of activity in mining matters there and that things are looking up in the "old reliable." The Roaring Lion lessees have four men at work and are doing considerable prospecting. Some ore is being taken out. The North Star, in American Fork, came to the front last Saturday with a shipment of ore that went 40 per cent lead and 34 ounces in silver. The Brooklyn shipped 250 tons of ore last week. The Rough and Ready mine sent in 100 tons of ore last week. The Alliance sent in a carload of ore last week that assayed 38 per cent lead and 78 ounces silver. The *Tribune* says that work and development is progressing on the mining claims eight miles up City Creek canyon with flattering indications of success. The Ensign Peakers are still bringing in specimens of ore bearing, as they claim, free gold. We hope they have struck it rich, but fear they have only found "tenderfoot gold."

WASHINGTON.

THE COLVILLE DISTRICT.—*Miner*, Nov. 28: State Geologist Geo. Bethune, who has lately inspected the mines of this district, speaks as follows of some of the properties visited by him: On the Old Dominion the work is being done in good shape and systematically. They are driving at a great depth a tunnel which will not have to be driven many feet farther before the main ore bed is struck. There is probably as much ore left in the stopes as has been taken out. There are good-sized bodies exposed that will pay to mill. At the very least there must be 5000 tons of ore on the dump. The Daisy mine is second to none in the State. The entire bill is one immense bed of ore and a tunnel run in at any point would tap ore and plenty of it. The Daisy has large bodies of milling and smelting ores. The work on it has been conducted in one of the safest ways possible. Stevens county should keep her smelter going right ahead. Ten thousand descriptive pamphlets will not catch a capitalist's eye like one single shipment of bullion. The Colville district no doubt ranks among the best. In the Okanogan you will find the oldest formation in the world. Here our surface rock belongs to another and later period, but if we go deep we will strike here the primeval rock that exists near the Okanogan surface. It is foolish for the ordinary prospector to search for mineral by geological rules.

WYOMING.

COAL, PETROLEUM AND IRON.—*Tribune*, Dec. 8: According to the report of Dr. Ricketts, State geologist, there were mined in Wyoming last year 1,412,958 tons of coal. This coal is distributed through five counties, and the mines are mainly on the lines of the Union Pacific railway, which is also the principal operator of the Wyoming mines, having raised nearly a million tons in 1889. The existence of great coal-fields suggests iron manufacture and petroleum, and both of these things have sections in the present report, but not extensive. A previous report of 1887 dealt extensively with this subject, hence its omission in the present one, but from such remarks as occur, we are led to infer that many of the wells sunk in Fremont county have the characteristics of those in Ohio and Pennsylvania. In one the flow is from 600 to 1000 barrels daily. One suggestion contained but not claimed in Dr. Ricketts' report is that people boring oil wells should first read what he has written, and in that way save a good deal of money they may lose by drilling in impossible places. As to iron, while the quantity this far is not great, the quality is good. That at the Hartwell mines contains metallic iron, 68 per cent; phosphorus, .058 per cent; sulphur, 2.46 per cent, which is superior to Lake ores for steel-making. A good deal of this ore has been sent to Salt Lake to flux lead and silver ores smelted there. On the whole, one may conclude that Wyoming, like Montana, is to contain great mineral resources when they are developed.

Don't Fail to Write.

Should this paper be received by any subscriber who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER

Mining Share Market.

Under a stringent money market and confidence impaired, railroad and other speculative securities at the East have drifted to lower levels. While this is the result at the East, in this city our leading speculative securities (mining shares) are exhibiting decided signs of returning vitality, which encourages the hope of better future, or at least, higher prices until the stock-gambling pool unloads. The pool is still using Potosi as the pivoty stock, and with good effect, too. The character of the work in the mine is such as to make it an attractive gamble. The late decline in the market brought in large lines of stock, and it is but natural for the manipulators to try to unload at a good round profit, so as to levy and collect assessments in January, February and March. Whether they will succeed in selling out, remains to be seen, for the times are not auspicious for much of a bull movement.

At the East money is scarce, failures are being reported and confidence is temporarily destroyed. In this city money is growing scarcer. Taxes have to be paid, and annual settlements made, with other disturbing influence natural to the close of the year. Soon after the first of next month money will begin to grow easier under heavy disbursements, when it is but reasonable to look for an improvement in all lines of business; but then successful stock gambling goes by the rule of contraries.

In outside mining shares, trading the past week was light. The Tuscaroras declined, the Bodies hung around, while the Quijotoas made a slight advance under reports of a contest for control. Those in position to know, affirm that there is a contest for the control of the latter—probably more for spoils than for the benefit of stockholders, yet any kind of change, it would seem, will not prove worse than the present condition of affairs.

Outside operators should not be influenced by the pool's cappers and friends using the names of Gen. Hayward, Col. Mackay and Senator Fair in connection with little stealing deals. There is nothing, so far as we can learn, to warrant the belief that, individually, any one of the above is in the market; neither is there anything to warrant the assertion that either one will take a hand in the market unless more favorable conditions of affairs are reported from the mines than now come to hand. That their agents in Virginia are closely watching the work going on in the several mines, does not admit of a doubt; but watching the mines and running the stock market are two different things.

James G. Rule, a Comstock ex-mining superintendent, is in the city. It is said that for the sum of $5000 he agreed to find rich ore in Gould & Curry. He was placed in charge of the mine, and soon afterward got his $5000. The ore, so we are informed, has not been taken out, but remains in the mine.

The stock market opened this [Thursday] morning barely steady. After call, Potosi began to shade off, closing weak at a decline of nearly $1 a share. This carried the prices for other stocks down. The street is full of bear points, although some bull points are beginning to be circulated.

The Comstock Tunnel Co. and the mining companies on the Comstock lode have arrived at an understanding regarding the royalty on all ore milled. The royalty is to be 4 per cent on the battery assays, provided the royalty does not exceed $2 a ton, or in other words, on all ores running from $50 a ton down, 4 per cent royalty is to be paid, and all over $50 the royalty is $2 a ton. The various companies affected will probably ratify the agreement some time next month.

Official news from the Comstock mines is still of picked-bone character, although a little encouragement is held out in Seg. Belcher, Hale & Norcross and Potosi. In an upraise in Con. Imperial they got in vein material, when work was stopped—probably for fear of finding ore. Private news from Potosi reported an improvement in the north drift, which sent the stock up, but as the price has gone down since, perhaps the ore has been spirited away. The work going on in the various mines is of a very important character, but no actual results are looked for for some months yet, although, in the meantime, ore is likely to be run into in one or more of the mines.

From the Quijotoas the usual reports come to hand. From the Bodies our advices report the mill still running on tailings. Some rich ore is being mixed with the tailings. The work in the mines is attracting attention. From the Tuscaroras our advices report the district never before looking so well. The outlook is of the most favorable character.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Modoc and Lassen Cos.
GEO. WILSON—Sacramento Co.
J. P. QUINETTE—San Francisco.
J. C. HOAG—San Francisco.
SAMUEL CLIFF—Creston, Cal.
J. H. CROSSMAN—San Bernardino Co.
JOHN B. HILL—El Cajon, Cal.
GEORGE EVANS—Santa Clara Co.
MRS. M. E. DUDLEY—Ventura Co.
ANDREW REID—Monterey Co.
B. F. BELT—Shasta Co.
FRANK S. CHAPIN—Colusa Co.
HELEN B. KING—San Benito Co.
WM. M. HILLEARY—Oregon.
WM. HOLDER—Oregon.
R. G. HUSTON—Montana.
H. G. PARSONS—Nevada.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

MECHANICAL PROGRESS

Bessemer and His Process.

At the late Pittsburg meeting of the English Iron-Masters and the American Institute of Mining Engineers, a very interesting letter was read, by Sir James Kelson, from the veteran metallurgist, Henry Bessemer, giving a breezy account of his great invention—how it was suggested and oradled, and how it hae grown to its present magnificent proportions. We give the following digest of the letter, which will he found hoth interesting and instructive:

It is with great pleasure that I accede to your request to furnish you with a brief outline of the circumstances which led to the invention of my steel process. At the time of the Crimean War I had invented a mode of firing elongated projectiles from a smooth-hore gun, the rotation necessary to insure their proper position dnring flight heing ohtained hy utilizing a portion of the powder gas to produce rotation hy reaction, after the manner of producing rotation in turhines, and not hy the rifling of the gun, consequently rendering all smooth-hore guns at once snitable for firing elongated shot or shell. I of course offered this plan to our own Government, hut it was discarded without a trial.

A little after this period I happened to he on a visit for a week or two with Lord James Hay at the house of hie daughter in Paris. Dnring this visit our host gave a farewell dinner to General Hamlin and several other distinguished officers in the French army, who were going out to the Crimea.

Among the gnests on this occasion was Prince Napoleon, and while taking a cigar in the library after dinner, the conversation turned natnrally enough on artillery, and I then mentioned my system of firing elongated projectiles from smooth-hore gune. The Prince wae eo impressed with the importance of this idea that he eaid he was eure hie couein, the Emperor, would he much pleased if I wonld explain my inventlon to him, and that he would get an appointment made with the Emperor for this purpose. This was done, and I had a long and most interesting discussion with His Majesty, whom I found most thoroughly conversant with the whole subject of srtillery. Hie Majesty, in the kindest possihle way, gave me carte hlanche to make any experiments I desired at Vincennes.

Some Early Experiments.

A great many 30-pounder elongated projectiles were made, and were fired from a 4½-inch 12-pounder emooth-hore caet-iron gun at the Polygon at Vincennes. They were fired through a euccession of thin wooden targets placed 100 metere apart, through all of which they cnt circular holee, thus ehowing that they went end on; a thin coat of hlack japan had heen purpoeely put on them, and when the ehots were recovered from the hank in which they were lodged, the coat of japan was seen to he partially ecraped off in spiral lines, caused hy their paeeage through the wooden target; the angle of these scratchee heing carefully taken, ehowed that from 1½ to 2½ rotations had taken place in the length oi the gun.

After many houre' practice, on a cold Deoemher day, we retired to the officers' quartere in the old fortresa of Vincennes, and while etanding around a hlazing wood fire, eipping some hot epiced wine, Commandant Minie (the inventor of the rifle) observed "that, although the rotation of the ehot was effected, nnlese we had eomething hetter to make our guns of, such heavy elongated projectiles could not he need with safety." This casnal observation was the spark that hae kindled one of the greateet Indnstrial revolutions that the preeent century hae to reoord, for during my solitary ride in a cab that night from Vincennes to Parie, I made up my mind to try what I could do to improve the quality of iron ueed in the manufacture of gnns.

My knowledge of iron metallurgy was at thle time very limlted, but this was in one eense a great advantage to me, for I had very little to unlearn, and eo conld let my imagination have fnll scope. After many monthe of trial and much huilding np and pulling down of reverheratory furnaces, I cast a small model gun. The iron was very white, and in turning it, little short curly ahavings were cut off. It wae wonderfully tough for oast iron, hut remarkahly hrittle if olassed ae wrought iron. The little model gun looked very heantifnl when highly poliehed, and I took it to Paris and hegged the Emperor to accept it as the firet frulte of my etndies of the metallnrgy of iron. He expreeeed himself mnch pleased with it, and complimented me on having achieved a etep in the right direotion, and with his own handa placed it in a hurean, eaying, "Some day it may hecome an intereeting relic."

On the Eve of Discovery.

Ahout this period I hegan to fully appreciate the faot that if I could improve oaet iron and render it malleahle, and etill retain ite fluid state, apart from ite use for artillery, it would he of the greateet oommercial value for all engineering purposee. I therefore pursued my exp riments with greater ardor than ever, for I was convinced that I was on the eve of producing a quality of metal that wonld snpersede wrought iron. I consulted Mr. George Rennie, the eminent civil engineer. I ehowed him a small upright fixed cylindrical converter, and in it we made a charge of 700 pounds of Blaenavon pig-iron into an ingot of malleable iron. Mr. Rennie was in raptures with the result, and said: "You muet not keep this light under a bushel for a single day longer; and, hy the-by, there is a first-rate opportunity for you. The British Association meets at Cheltenham next Tuesday; read a paper there hy all means. I am president of the mechanical section. It is true all the papers are arranged, hut if you will write a paper, I will take the reeponeihility of putting it first on the list." He kept his promise, and I read my paper "On the Manufacture of Malleable Iron Without Fuel."

The entire iron trade of the kingdom wae startled hy the facts detailed in this paper, hacked as they were hy two small hars of malleable iron, one of which had heen piled and re-rolled. A few days later the ironmasters came trooping np to London to see the new proceee. There are many interesting incidents connected with these vieits, which I cannot trespass on yonr time to relate; hut some idea of the excitement may he gathered from the fact that, notwithstanding the imperfect etate of the process at that time, I was aotually paid £27,000 for licenses granted within one month of the reading of my paper. At many ironworks, the managers set to work to test the invention in the rudest possihle manner, with such means aa they had at their disposal, all of which attempts were failuree. In my experiments I had used Blaenavon pig-iron, which was successful, and at that time I had no idea that other hrands of iron would fail in the manner they did. No sooner were these failures known than an extraordinary revulsion of feeling was manifested, and the most perfect dietrust of the invention hecame universal. The pnhlic press, which had spoken of it in such glowing terms, now condemned it as impracticahle, and spoke of it as "a hrilliant meteor that had flitted across the metallurgical horizon, dazzling a few enthnsiasts, and then vanishing forever in total darkneee."

Blacksmithing.

Something for All Mechanics to Conoider.

There ie no trade of more importance than hlacksmithing. It enters, more or lees, into every department of ironwork and into most parts of woodwork. To he a good hlackemith requires large experience and much mechanical skill. The expreeeion ie often heard in regard to an unskillful machinist: "He'e nothiug hut a hlacksmith." Well, if a man ie nothing hut a hlacksmith and is a good one, he is most certainly a skilled mechanic. There is nothing in the nature of hlacksmithing that is one whit helow or requiree less mechanical ekill than the workman in any other department of ekilled lahor.

It has, however, heen sometimes said that hlacksmiths are more inclined than other mechanics to keep to themselves the little secrets of their trade that they may have acquired through experience, or which have heen handed down hy friende. Many of that particular calling argue that since they have spent yeare in acquiring the knowledge they poseess, they cannot afford to part with it for nothing. This is certainly a very poor way of reasoning or thinking. Time perhape wae, 20 or 30 yeare ago, when technical papers were almost unknown, and there might have heen some exouee for imparting information when no knowiedge in kind oonld he received. But the ahundance of technical papere at the present time devoted to imparting euch information rendere it most important that every one who hae a new idea ehould make it public for the henefit of all. If each will do his part in that way, all will he henefited. This is a policy which will well repay as we progreee.

There are many, eaye a cotemporary, in all our large shops, hoth hlackemiths and machinists of all olaeses, who can make their names a household word and secure a host of friends hy just jotting down items of mechanical intereet. The hoy of to-day ie the man of tomorrow, and never forgets the source from which he received a benefit while learning a trade.

Mr. D., for example, might come out of his shell, and we ehould all listen to him with pleaeure. Some good man on locomotive work might discuee the queetion of forging a locomotive frame, or how to forge a double eye, if ont of the eolid, and how to do it if welded, with reaeons for the method given.

Then there ie the hlacksmith who used to forge ateel hand-hammers at one heat. He could certainly tell many of ne eomething. Again, many a country hlackemith does a good joh nnder difficulties that wonld appear insurmonntahle to many who have every convenience at hand.

In marine work there are plenty of examples of expert forging. A eet of examples of forging, heginning with a eimple holt with solid head and with welded head, deecriptiona of the various kinds of welde and points ahout welding, and so on, would do a world of good to our young men, and would bring out pointe of interest to all. Welding and hending angle irone ie another hranch that will well hear diecuesing. Let each one do his part and write of that hranch with which he ie hest acquainted and all will learn something.

RACING across the Atlantic hy the fast steamers will he discontinued hy mutnalag reement. The enormons cost and riske for bid the continuance of euch contests.

SCIENTIFIC PROGRESS.

The Evolution of the Horse.

At the recent National Exhihition of horses in New York, more good animals were brought together than were ever seen in one collection in this country. With this statement goes another fact, that some of the fasteet horses in the world are produced in the United States, and that California is one of the foremoet States in the matter of horse hreeding. But there is much more than this apparent. The trotting horse is an evolution hrought ahout in this country. Such horses make no prominent figure in England. The running horse is always in the lead. Now, one of the greatest gains in the evolution of the horse in this country is the prodnction of a roadster. Racing is a mere incident. The runner is never a roadster, and is in no prominent sense a utility horse. But the trotter comes to this at last that he is a superh road horse. Beyond all other gaine, this ie the greatest. The heet of these will go over the road at the rate of ten miles an hour for several consecntive hours. A mile in six minutes is fast enough for any horse not designed for the race-track, hnt the same roadsters will frequently do a mile in three minutes.

Some recent criticisms touching the evolution of the horee are to the point that the swift horse is no longer a handsome animal; that he is freqnently under size and is far from the ideal of a symmetrical animal. The form has heen sacrificed to speed. It is seldom that the winners of prizes on the race-track are 16 hands in hight or weigh much over 1000 pounds. They are comparatively small horsea, and very few of them would he suitshle for the road. The Kentucky horsemen prodnced two famous classes of horses. One was the saddle horse, which for pluck, speed and endurance probahly never had a euperior in thie country. The other olase was the road horee, whioh hecame famoue all over the country. He was not a small horee, hut was well up on the withere, high-spirited and of splendid action. Of course there wae also the running horse, which was the especial pet of the Kentucky hreeders.

But the evolution of the trotter has probahly brought more wealth to the conntry hy hie general utility than any other claee of horses. He is now everywhere on the road—high-spirited, strong and swift, he is the pride of thoueands who take no intereet in the race-track and care nothing for runnere, hecanse they are not adapted to the road. The road horse ie an evolution which hae heen brought ahont hy epecial training. There were never eo many good ones in the country at any former period. Not one in a thousand of these ever makes any prominent figure on the race-track, hut they figure as never hefore in the wealth of the country. That is hy far the greateet gain which hae reeulted from thie modern evolntion of the horse.—*Exchange.*

THE INVISIBLE WORLD.—I am glad I live in the nineteenth centnry, when mysteriea are heing lifted, and every day multiplies the anologiee hetween science and religion, and we may hope to see the orown yet whioh glitters on the tripartite kingdom of science, religion and grace. Is there an invisible world? and do we enjoy our homes alone, or ie the air filled with loved ones and aerial heinge? Science eaye "Yes," and it depends upon the number of seneee we have whether we agree with science. Our minde are in prieons, from whioh they look out through windowe in the walls, and that mind which enjoya the greater ontlook mnet see more than others. Our preeent inahility to see angele is no argument against their exietence, ae what we know dependa upon the numher of our eensee. The windows of the houee in which we live are glazed or etained. We cannot aee or hear all. The dog accompanying ue through the foreet ecents the game of whioh we had no knowledge. The atmosphere ie populons with particles that elude the prism and the ecalee, yet they lend the sky its azure and dietrihute the eunheams over the earth. Sound consists in the movement of the air and the existence of an auditory nerve. The deaf are inensihle to thunder, yet it thunders. Negative scientific schools say they cannot find onr God anywhere! Does not their science teach them that there ia another world which neither scalpel nor microscope can explain or explore? Scientific men know that the atmosphere ie crowded with life germs, and is it too much to aek that we he permitted to helieve that hack of theee life germs higher livee and more distinguished organisme exist? Were our eare properly attuned, we might hear the atmosphere, now silent, musical with the tread of angel feet, and it may all come in good time. Do angele tread the air we hreathe?—*Rev. J. Sanders Reed.*

LUMINOUS WATER.—Ernest Fabrig, in the *Chemical Trade Journal*, narratee that, heing in a dark room, having in hie hand a sealed hottle partly full of a solntion of ozone water, he idly shook it np; whereupon a eoft phoephorescent glow of light floated ahove the surface of the water and pervaded the epace in the npper part of the hottle. The appearance was only momentary, hnt on shaking up the liquid again immediately afterward, the light reappeared, although in much diminished intensity. Further repetitions of the shaking failed to produce any results, but after an interval of ten daye the liquid had apparently regenerated its luminous power, for the eame effecte could he produced with it, although weaker. The phenomenon was afterward observed in another way, and some specially remarkahle results were ohtained hy pouring a small quantity of an ozone solution into a glass heaker containing ordinary water. At first the cone-like projection of the solution, where it falls into the water, hecomes luminous, and then the light snffuses the whole mass as the liquide hecome thoroughly mixed, finally dying away. It is described as a soft phosphorescent glow, which quickly spreads over the mass of fluid or gas, as the case may he, and as quickly disappears.

SCIENCE SENSES.—In the past 10 or 15 years there has grown np a need for special training of the senses, in order to use properly scientific instruments, not in study or in any way applying to it, hnt as necessary adjuncts of business communication in every-day life. First on the list will come the telephone. Most persone using one for the first time find themselves absolutely *hors de combat*, unable to recognize a familiar voice, and are only conscious of the most helpless hearing-deafness. After a short training the ear and mind adjust themselves with a wonderful nicety to the new duty required of them, and learn to recognize a voice as unerringly as though talking face to face with the individnal who is, perhaps, miles away. Following closely in the wake of the telephone, which may he looked upon as the pioneer of the inventions which will later rely upon the auditory nerves or hearing for their use, is the graphophone, a marvelous little machine, whose fitness for the work it has to do is so wonderful that, were it not explained on purely scientific principles of natural laws, man would think the inventor of it in league with the "Buyer of Souls." It records sounds hy the vihrations of the air acting on a steel stylus, which is so placed that it cuts or traces fine lines on a cylinder of rubber coated with wax. These lines are of varying depth, according to the force of the sound waves. The vihrations or sounds are reproduced hy the aforementioned cylinder heing revolved under a small stylus to which ie attached a pair of tiny ear trumpets which are so adjusted that they transmit with absolute fidelity every sound wave to the ear. It is impossible to predict the boundary line of scientific discoveries and the need to which man may put them in the near future.—*Scientific American.*

SLIME DEPOSITS IN WATER.—In storing "potable" water, in either ponds or tanks, there is nearly always neglect of means to cleanse the sediment deposited. Where such sediment comes from, especially in tanks fed hy springs, is not easy to determine; but that there is a deposit of from one to two inches of black slime each year is obvious enough. This slime is filthy in the last degree, and the water is spoiled. The sun has some strange effects in such cases. Covered tanks or pools do not become stagnant, or rarely do, while open ones without circulation are certain to hecome coated with a vegetable growth on the sides that is marvelous. This is especially true of artesian water when it is warm. At Stockton, a few weeks sniffices for a thick, green vegetable growth on the sides of the pools, which decays, falls to the hottom, and produces the black slime before mentioned. In the case of pools or reservoirs with sloping hottoms, there is an easy remedy hy providing a catch-hasin or pocket, with a "blow-off" outlet. There is always some risk in direct pipes to the hottom of a reservoir, hut the arrangement is common, and a service-pipe and blow-off, or cleaning pipe can he carried in together, the inlet of the former heing fixed above the catch-hasin or sump. Another way would he to put a siphon-pipe into the sump so that it could he cleaned to some extent without emptying a reservoir.

MICROBES IN HAILSTONES.—Bacteria of various kinds have heen found in snow and even in ice. Dr. Fontin, a Russian scientist, it is said, has demonstrated that hailstones are not free from them. He has found that the water from the melting of hailstones contains an average of 729 hacteria per cubic centimeter. Neither yeast fungns nor mold was present, but nine different kinds of bacteria were found. As the ordinary dwelling-place of the *Bacillus mycoides*—one of the species found—is the earth, it appears that microbes of terrestrial origin may he carried up into the air, and thus rain, snow and hail may he the direct means of conveying infection.

YEAST.—It was found some 50 years ago hy Cagniard, Latour and Schwann that the mysterious snhstance known to brewers as yeast or barm was really composed of a vast number of minute oval particles endowed with the powers of growth and multiplication, and therefore undoubtedly living.

SOURCES OF HEAT.—There are four principal sources of heat: (1) physical, (2) chemical, (3) mechanical and (4) physiological. The physical sonrces of heat are solar radiation, stellar radiation, terrestrial radiation and electricity.

FRESH-WATER SHARKS.—A naturalist claims to have discovered in the river approach to Lake Nicaragna, and in the lake itself, the only fresh-water sharks known.

THE EARTH is nearest the sun on the second day of each year, on which day she is only 90,822,000 miles from hie solar majesty.

ELECTRICITY.

The Rise and Progress of Electrical Science.

Some vague notions in regard to electricity existed even as far back as the time of Thales of Miletus, who lived about 600 years B. C. It seems to have been discovered about that time that the fossil gum, known to us as amber, upon slight friction possessed the peculiar property of attracting small objects to itself. The Arabs called the gum "karabe" or "catch-chaff;" while to the Greeians it was known as "elektron," from which name its peculiar property of attraction has since become known as electricity. Theophrastus, Aristotle and later the elder Pliny took much interest in the matter, which was, however, only regarded as something curious rather than useful, until about the year 1600, when Dr. Gilbert, an Englishman, took up the subject and began to treat it in a scientific manner with a view of the possibility that it might, at some time, be made of utility to mankind. He found that similar phenomena were connected with many other substances than amber. He also showed that they were even manifested in animals. He claimed that the similar phenomena connected with what are now known as electrical fishes, as the torpedo and those now known as animal magnetism, as exhibited in the cat and in man as well, were of the same nature as those first observed in amber. He also devised and exhibited many curious experiments which greatly interested the philosophers and other thinking men of his day. From that time to the present electricity has presented a peculiar field for scientific and technical research.

In More Modern Times

We have the researches and experiments of such men as Boyle, Guericke, Sir Isaac Newton and others; but it was our own Franklin who first proved that these phenomena were produced by the same subtle agency as that which causes the terrific commotion manifested in a thunder-storm.

Later we have the names of Faraday, Tyndall, Thompson, Morse and our own eminent countryman Edison, whose inventive skill in putting electricity to useful work leads all the rest. The first electro-magnet was made in London in 1825.

The First Electric Telegraph

Actually put into commercial use was put up in Munich by Prof. C. A. Steinheil in 1836; it was 12 miles in length. A single wire was used, grounded at both ends. The signals were sounds upon bells of different tones. A device was also invented by the same person which imperfectly traced lines and dots upon a ribbon of paper moved at a uniform rate, on the same principle as subsequently adopted by Prof. Morse. The next practical telegraph was put up in England in 1837 between Paddington and Drayton, a distance of 13 miles.

The first American telegraph was put in operation between Washington and Baltimore in 1844, by Prof. S. F. B. Morse, whose attention was first called to the matter and the principle of its working explained to him by Prof. Chas. T. Jackson. Prof. Morse subsequently worked out a far more practical device than any which had previously been presented to the world, and which has ever since continued to be generally acknowledged as the most effective and simple ever devised.

A Near Approach to the Electric Telegraph in 1747.

It has been said on what seems to be very good authority, that in 1747 Bishop Watson sent the discharge of a Leyden jar through 10,600 feet of wire suspended on poles on Shooter's Hill, and a plan for an alphabetical telegraph appeared in *Scott's Magazine* for 1753, which, however, seems never to have been realized in a practical manner. At Geneva, in 1774, a telegraph line was erected by Lesage, consisting of 24 pith ball electroscopes, each representing a letter. If either of these experimental attempts had been properly worked out and followed up, the world would have been in possession of the electric telegraph nearly a century before the invention of Prof. Morse.

The First Submarine Telegraph

Was laid by Samuel Colt—of pistol notoriety—from Coney and Fire Islands in New York harbor up to the city. The first laid in Europe was under the waters of the Rhine from Deutz to Cologne. The next was from Dover to Calais. All these were single wires insulated with gutta-percha. The next grand and important attempt was the connection of the American and European continents in 1857-58.

Who Was the Real Inventor of the Electric Telegraph?

Is a difficult question to solve. Prof. Morse is generally considered as most fully entitled to that honor, although, as hereinbefore stated, there were two lines at work in Europe before Morse perfected his invention and set it at work. But there is a history even before that, aside from the experiments of Bishop Watson above alluded to, made in 1747. In the year 1832, Prof. Morse was a passenger on board the ship Sally with Prof. Chas. T. Jackson of Boston, bound from Liverpool to New York. This, it will be noticed, was four years or more before the first telegraph was put in operation at Munich. During that passage much conversation was held between the passengers and Prof. Jackson, who was well known to be thoroughly conversant with the science of electricity as it stood at that time.

Prof. Morse, then quite a young man, was particularly interested in these conversations, although he knew but little or nothing of the science. During one of these dinner-table talks Prof. Jackson told the company that electricity would soon be introduced as a means of telegraphy, to take the place of the clumsy signals which were then in vogue, by flags and other means of sight, to convey words from one hill-top to another in view. The professor pointed out several ways by which it might be done. His plan, as he told it to the writer some 20 years ago, embraced the essential features of the Morse system as introduced by him some 12 years later. Mr. Morse was intensely interested in this matter, and just before his arrival in New York, asked Prof. Jackson to refer him to such persons and books as might enable him to study the general subject of electricity and also Prof. Jackson's views of its new application in particular. Prof. Jackson, two years later, constructed and successfully operated such a device as he outlined to Mr. Morse, and exhibited its working to Mr. Francis Alger and others of Boston. But it could not be successfully worked because up to that time no continuous electric current could be produced. The sustaining battery invented by Daniell in 1837, eventually furnished what was lacking to Jackson in 1834; but he had dropped the matter in the pursuance of other studies, while Prof. Morse laid down his brush as an artist and made his fortune by putting into practical use Jackson's device which was made possible by Daniells' invention.

The Recent Progress in Electricity

Is too well known to need any extended mention here. There are now 942 submarine cables, exclusive of the seven cables which span the Atlantic ocean. The land telegraph lines are almost without number. They have unrolled the wire reel without stint, and now measure nearly two millions of miles in extent of circuit. Outside of the telegraph and telephone, the applications of electricity to the various industries are almost without number. The figures which tell of its progress in that direction are absolutely bewildering. More than $600,000,000 are already invested in electrical industries in this country alone. These industries sustain at least 1,000,000 people. Moreover, the progress in this work has been attended by a steady decline in the cost of the electricity itself and all of its appliances and apparatus as well.

Since the announcement of the telegraph and the telephone there have been no announcements of startling inventions; but the progress in this field of work has been steady and forward all the time—never a drawback in any direction. The only thing that has appeared at all in the way of progress has been the dangers which have been incidental to its rapid progress—a progress so rapid that the people have not been able to keep up the needed education which must always follow in the wake of every important departure from the beaten track of progress. It has already entered into the shop both as a power and as a working element. It melts, it hammers, and it has proven the best welding device which has ever been introduced. As light, it is unrivaled.

It is supplanting or rather supplementing steam everywhere. It is the cheapest and most convenient carrier of power known. It is fast working its way upon the rail, and is destined to become the possibility by which extraordinary fast time in passenger and package transit can be attained. It has already entered the mine and is there to stay and spread.

In regard to its limitations or possibilities, who can tell? It is evidently the great agent by which the greatest difficulties in human needs and industries are to be solved in the most satisfactory manner.

USEFUL INFORMATION.

CONSUMPTION OF COTTON.—The *Commercial and Financial Chronicle* of New York makes a very exhaustive statement of the cotton crop of the United States for the year ending Sept. 1, 1890. In this centenary year, a conception of the extent of cotton culture will possess a particular interest. The total crop reaches 7,313,726 bales, while the exports are 4,916,847 bales, and the spinners' takings are 2,342 328 bales, leaving a stock on hand at the close of the year of 61,269 bales. The growth in the consumption of cotton by spinners becomes more notable from year to year. In 1868-69 there were only 5,000,000 bales of cotton manufactured in the world, against 11,000,000 bales at the present time, which indicates an increase of 120 per cent in the use of cotton for spinning purposes in 21 years. A still more wonderful expansion is found in the figures as revealed in the showing made in the last five years, which is the most wonderful in the history of the trade. In 1884-85, the total consumption by the mills was 8,597,000 bales of 400 pounds each, against 11,035,000 bales of same weight in 1889-90, showing an increase of 2,438,000 bales, or nearly 30 per cent in five years. In 1889-90, the world's consumption of cotton amounted to 11,965,000 bales, not including American cotton consumed in Canada, in Mexico, and burned. Of this quantity, the United States consumed 2,731,000, the continent 4 277,000, India 930,000, and Great Britain 4,027,000 bales. From the best information obtainable, it is found that there has been an addition in the South, during the past year, of 275,000 spindles and an addition of only 100,000 spindles in the North, making a total addition for the whole country, during the past year, of 375,000 spindles. The present number of spindles in the country is 14,550,000,000, of which the South has 1,725,000,000 and the North 12,825,000,000.—*Providence Telegram.*

A NEW USE OF THE PHONOGRAPH.—A new development of the use of the phonograph, which promises to bring the instrument into the field of practical medical science, has just been demonstrated. Mr. Ernest Hart lately suggested that the phonograph might with great advantage be employed to record the characteristic changes in voice sound which mark a variety of diseases. According to the *British Medical Journal*, this suggestion was acted upon, and Dr. Felix Semon consented to select from his patients at St. Thomas's Hospital a few cases in which pathological varieties of phonation were present. This was carried out with great success, and at a recent gathering, at which a considerable number of eminent men of the profession happened to be present, the phonograph reproduced the characteristic vocalization of some of these diseases with the most realistic effect. The whoop of whooping cough, with the intervening cries of the patient, were as vividly reproduced as if the child were in the room, and so also with the hoarse utterances of a case of stenosis of the larynx. The opinion was universally expressed that this new application of the phonograph to the purposes of diagnostic and clinical instruction constituted a solid gain for teaching, and probably for many other purposes. It will be possible to reproduce a series of cylinders capable of use in every medical lecture-room and clinical theater, which, at but little cost and without any difficulty, will afford to students and practitioners a lifelike reproduction of these characteristic sounds which no amount of mere word-painting can afford.

VARNISHED WIRE FOR ROOFING.—The *Stoves and Hardware Reporter* states that wire, covered with varnish, is being satisfactorily employed in cases where glass will not stand the vibration or other conditions. The transparent wire-wove roofing, which is translucent, pliable as leather and unbreakable, has for its basis a web of fine iron wire, with warp and weft threads about one-twelfth of an inch apart, this netting being covered on both sides with thick, translucent varnish, containing a large percentage of linseed oil. The process of manufacture is conducted by dipping the sheets into deep tanks, containing the composition, until the required thickness is obtained; the sheets are then dried in a heated chamber, and after being stored for some time, till thoroughly set, are ready for use. The sheets are made in any color, from amber to pale brown, and as the material readily adapts itself, when placed with ordinary skill, to curves and angles in roofing, and is unaffected by steam, the heat of the sun, frost, hail, rain or any atmospheric changes, it is likely to have a large application.

AN IMPROVED SEWING NEEDLE has been patented which secures the end of the thread in the eye, instead of having a running thread as in the case of ordinary needles. The eye of the needle is round or oval at the bottom, and tapers away chisel-shape at the top or head, thereby causing sufficient elasticity at the top of the eye to hold the thread perfectly rigid. This invention does away with all cutting of the thread, which is the case with ordinary needles where a running thread is used. The object of this invention is to allow the cotton thread to be easily passed through the hole and pulled up toward the head, so as to fix the thread in the chisel-shaped slit, and thereby prevent the thread from slipping out, as is the case with ordinary needles.

GOOD HEALTH.

About Expectoration.

Aside from being an exceedingly filthy habit, the custom of free and careless expectoration involves dangers to health which are not generally understood, but which are nevertheless in no sense fanciful.

It is well established that the poison of certain diseases appears in the expectoration. The germs of consumption are known to be minute, rod-like vegetable bodies, visible only by the aid of the most powerful microscope. In the matter expectorated by those afflicted with this disease the germs are met in large numbers. By experiment it has been determined that they are very tenacious of life, and can be destroyed only by certain fluids or by exposure to a high temperature for a considerable length of time.

It is easy to see, therefore, that if the expectoration from the lungs is allowed to lie exposed till it becomes dry, the germs will be taken up and scattered abroad by the air currents, and in this way a fruitful source of contagion will be provided.

Fortunately, most people in good health remain unaffected by the germs which have found entrance into the body. It is only when the powers of resistance are weakened by some defect of the constitution, or when some unusually favorable opportunity for infection has been given, that the poison gains a mastery and produces disease.

When we consider that in a hall of moderate size, which has been occupied by an audience for an hour or more, there are millions of germs of various kinds, some of which, under favorable conditions, are capable of producing disease, then the wisdom of such a provision of nature becomes apparent.

No doubt every one has felt a certain disgust at the hawking and spitting which is met with to a greater or less extent in all public places, and it is well for every one to know that there are excellent sanitary reasons for the observance of a rule which good breeding and a care for the feelings of others ought to be sufficient to enforce.

It is in the discovery of the real causes of disease that we shall most surely find the valuable means of prevention. If we must expectorate, let us at least refrain from doing so in public places.—*Youth's Companion.*

POWER OF THE IMAGINATION.—The Philadelphia *Times* tells how a dream of death was accurately carried out to the peaceful end. The story is as follows: A remarkable instance of the hold superstition has upon the mind of even the educated and religious was recently exhibited in the case of Mrs. Rebecca Byrnes of Helena, Ark., a lady noted for her intellectual attainments and pious life. One morning, rising in what seemed her usual health and spirits, she summoned her children to come to her. One son was residing in Topeka, Kan., one in New Orleans, two daughters were married and living in Sedalia, Mo.; but obedient to their mother's call, they came at once, though ignorant of the reason of their summons. When all were about her, the lady informed them that she had had a dream in which her husband, who had been dead for nearly 15 years, had warned her that she had only ten days more of life. She had sent for her children to bid them good-by, which she proceeded to do with much calmness, but with the air of one who had not the slightest doubt that she was already dying. Her friends attempted to reason with her and to point out the folly of placing such perfect confidence in a dream, but all to no purpose, for the lady persisted in asserting that she would depart from earth on such a day and exactly at a certain hour. Her pastor remonstrated with her and even brought the severest censure to bear on her superstitious credulity, and at last Mrs. Byrnes ceased to speak of the matter, so that her family had begun to think she had conquered her fancy. She continued in excellent health and pursued her usual daily life, but just before the hour she had predicted would be that of her death she sought her children and bade them good-by, then seating herself quietly in an arm-chair, expired just as the hour was struck. The physicians declare that her death was due solely to her imagination.

INTELLECTUAL WORK.—"It is not intellectual work that injures the brain," says the London *Hospital*, "but emotional excitement. Most men can stand the severest thought and study of which their brains are capable and be none the worse for it, for neither thought nor study interferes with the recuperative influence of sleep. It is ambition, anxiety and disappointment, the hopes and fears, the loves and hates of our lives, that wear out our nervous system and endanger the balance of the brain."

CREMATION is more extensively practiced in Italy than in any other country. The first crematory was established in Milan in 1876, and there are now 50 in operation in Italian territory.

SMALL HURTS.—A medical journal declares that a healthy man will actually suffer more from the prick of a pin than he would from the pains of dissolution in case he died a natural death.

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Business Announcements.

[NEW THIS ISSUE.]

Dictionary—G. & C. Merriam & Co., Springfield, Mass.
Silver Mine for Sale—Prospector, San Rafael.
Situation Wanted—E. W., East Oakland.

See Advertising Columns.

Passing Events.

The weather—for this is now the subject uppermost in the California mind—the weather, then, he it observed, is not shaping itself quite to our liking. After nearly seven months of uninterrupted drouth, there was vouchsafed us in the early part of last week a couple of rains, wide extended and very welcome, but not over-abundant. This done, the weather relapsed into its old mood, illustrating in its peculiar way the force of long-continued habit. Meantime the grass has been started; also the plows, the surface of the ground having been sufficiently moistened for this. But vegetation proceeds slowly, the atmosphere being dry and cold; at the present writing, though not suffering from drouth, we would be the better of a little more rain.

During the behdomadal we are talking about, nothing of special interest has occurred in the mining world. As there are no big strikes, so are there no lamentable disasters to record, a fair amount of success with a gratifying exemption from accidents having attended the labors and the life of the miner.

Owing to the vigorous precautionary measures adopted by the military, the threatened Indian outbreak will no doubt be averted.

Operations on a reduced scale are to be resumed at the works of the Judson Manufacturing Company despite the late strike. The non-union men are being protected by the police.

There has just been completed at the Benicia Agricultural Works the largest traction engine ever built. It weighs 20 tons and will pull 40 plows going at a rapid pace.

Maria Price, a colored woman, died in this city four days ago, aged 106 years. She was born a slave but purchased her freedom in 1840, being then 55 years old. For the past 30 years she has resided in California.

The city of Chicago having appropriated the sum of $5,000,000 in aid of the World's Fair, the outlook for the great show may be considered auspicious.

It is by some suspected that the present visit of King Kalakaua to this country may have something to do with the question of annexing the Hawaiian Kingdom to the United States; meanwhile His Majesty remains noncommittal on that subject.

A Long-Neglected Duty.

Section 26, Article IV, of the Constitution of California contains the following clause:

"The Legislature shall pass laws to regulate or prohibit the buying and selling of the shares of the capital-stock of corporations in any stock board, stock exchange or stock market under the control of any association. All contracts for the sale of shares of the capital stock of any corporation or association, on margin or to be delivered at a future day, shall be void, and any money paid on such contracts may be recovered by the party paying it by suit in any court of competent jurisdiction."

As will be seen, the language of the above clause is *mandatory*. It does not say that the Legislature *may*, but that it *shall*, pass laws for the purpose mentioned. But no such laws have ever been enacted by the Legislature of this State, notwithstanding that body has held four sessions since the Constitution containing the above clause was adopted. Whatever the cause of this remissness, certain it is the framers of the Constitution as well as the people who adopted it expected that laws of this kind would in due time be passed. Had this not been so, there is little doubt but the convention that prepared the Constitution would have engrafted upon it a provision designed to compass the end contemplated; just as they did in the same clause declare that all contracts for the sale of shares on margin or to be delivered at a future day shall be void, and any money paid thereon be recoverable in a suit brought in any court of competent jurisdiction, and which is now the law of the land, no legislation having been required to give this clause of the Constitution effect.

As our Legislature is soon to convene, we take occasion now to call the attention of the members-elect to this oversight, hoping they will see that this mandate of the Constitution is complied with. We have already a statute prescribing the duties of the trustees of mining companies and the rights of shareholders. Let us now have a statute regulating or prohibiting this business of buying and selling the shares of corporations in stock boards subject to the control of any association.

What action the Legislature should take in the premises is not for us to say. All we insist upon is that such action be taken as the Constitution requires. Our law-makers may, if they deem it expedient, prohibit this class of transactions altogether, there being warrant in the Constitution for their doing so, or they may in the way of "regulating" these associations offer a bonus for those transacting the largest amount of business annually. They had better consult their constituents on this point. Public opinion is always a safe guide in these matters. It is never safe, however, to set at naught the clearly expressed purpose of a Constitutional convention. If the members of the Legislature cannot see their way to a suppression of these stock operations, let at least enough "regulating" be done to show a decent respect for the fundamental law of the land.

ELECTRIC PLOWING.—An installation for the purpose of plowing the land by electric motors has been set up on property belonging to the Marquis de la Laguna of Spain. The power of a water-wheel of about 20 H. P. will be employed, and the implement for working the land is expected to work at a distance of three miles from the generating dynamo. A deficiency of mechanical and agricultural knowledge on the part of those intrusted with the work seems likely to make this trial a failure.

THE German East Africa Company has issued 150,000 silver rupee pieces for circulation in East Africa.

Gold Mining in the Older States.

They talk flippantly of gold mining in the Southern States. Every now and then we read the announcement that a company has been formed in New York, London, or elsewhere, for the purchase, opening up and equipping of a gold mine in Virginia, North Carolina or Georgia. The capital provided for this purpose is large. It is divided into many shares, which are offered investors at tempting figures—that is, if the value of the property as set forth in the company's prospectus may be accepted as conclusive on that point. From the manner in which these companies start out and the preparations made, the uninformed would be led to think that a great production of bullion was soon to follow. Dividends commensurate with such production would, of course, be looked for.

But behold the outcome! For the measurement of this, it does not, as some might be led to expect, require many millions. A few thousands suffice to cover values produced. In the three States mentioned, which cover the principal gold-bearing localities east of the Mississippi, the yearly product of bullion amounts to less than half a million dollars, the output of the companies operating there averaging hardly more than $20,000. In other words, these three States in such close proximity to the great money centers, aided by so much capital and enjoying the advantages of cheap transportation, labor and machinery, turn out only about half as much bullion as any one of the larger mines on this coast.

The truth is, the gold is not there; and such being the case, these companies are not to be censured for the meager results obtained. A small showing of the precious metal goes a long way in these countries. On it great hopes are built and big enterprises undertaken. Moreover, it is the case, if reports may be accredited, that there is something exceedingly misleading in the appearance of much of the gold found there. In certain parts of North Carolina, the quartz obtained is said to be coated with a thin film of gold. This, while it pleases the eye, is very deceptive, the body of the stone containing little or no gold. Trusting to these alluring appearances and the tests made by an incompetent or careless expert, a New York company put up costly machinery to work this ore, which under the stamps yielded an average of only $1.41 per ton, which necessitated the abandonment of the enterprise after a large sum had been expended in the fruitless endeavor to make it a success.

At Dalonaga, the principal gold-field of Georgia, nearly all the water available for washing is owned by a single company. This precludes extensive operations in that locality, which, even if water were plentiful, could make no large production, the diggings being comparatively poor and of limited extent.

Clearly the world has not much to expect in the way of gold supply from the States named or any other of the "old original thirteen." Farther west must the nations look for substantial aid in this particular. Here, where it takes over a hundred millions to represent the annual output of our mines, must they come for the bulk of their gold and silver as well as for much of their lead and copper, not to speak of the products of our forests and fields coming in to so largely supplement the product of our mines.

MORTALITY AMONG MINERS.—There are undoubtedly good grounds for carefully investigating the causes for the high rates of mortality among Cornish miners shown by the statistics published by the Registrar-General, says the Levant *Herald*. It appears that since the year 1862 there have been 12 great colliery disasters, causing in the aggregate no fewer than 2293 deaths, in connection with which £402,022 was raised by public subscription. No parallel disasters have occurred in the tin and copper mines of Cornwall, and it is obvious that but for this exceptional fatality the mortality among coal miners would have compared still more favorably with that of the Cornish miners. It is true that the death rate from violence among Cornish miners is twice as high as among all Cornish males, but this proportion is far below that which prevails among coal miners. The approaching census will once more afford the means for calculating the varying rates of mortality that prevail among persons engaged in different occupations, and it is to be hoped that this important matter will again be subjected to careful investigation and analysis. This would appear to be the only satisfactory manner for testing the assertions of the Government and of its mining inspectors, that the unfavorable conditions under which the mining industry was prosecuted in Cornwall no longer exist or have been very materially improved. If such has been the case, the mortality statistics, when next they are calculated, will stand out in striking contrast to those to which we recently referred.

Present Status of Gold and Silver Mining.

It is not rendering the mining industry a kindly service to speak of it in terms of unqualified praise or extravagantly hopeful. It is a business beset with obstacles and inherently difficult. It calls for all the economy, skill and care requisite to success in any other calling, results even then being often disappointing. This need not be insisted upon. Our experience proves as much. As every mining camp has its cemetery, so also has every mining camp its industrial graveyard.

But for all this, the present status of gold and silver mining compares favorably with that of any other, even the most successful of our leading pursuits, nor is its past history more fruitful of disaster than theirs. This business stands to-day more entirely on its own bottom than manufacturing, trade or farming. This class of miners are not alms-seekers. They are not among those who are clamoring for Government aid, nor are they otherwise suppliant for special favors. They do not desire to be fed from the public crib. They do not want the Government to advance them money at the rate of two per cent on their mines nor on the product of these properties. That has been left for the northern grain-grower and the southern planter.

It is the bankers who fail and cheat their depositors, and the merchants who make assignments for the benefit of their creditors, the latter doing well if they get twenty cents on the dollar. It is the manufacturers who are in straits, not the miners. It is the countries where there are no mines of this kind that are financially distressed and from which we on this side hear the cry, "Come over and help us." In the Middle and Far West, where they mine for the precious metals, there is no such distress, though they manufacture but little. There are here no sweeping failures and but few assignments. There is here but little of that perturbation and excitement experienced in other lands, and this chiefly because we enjoy the blessings incident to this most solid, stable and enduring industry. Mining for gold and silver, purified by its trials and purged of its abuses, stands to-day the model industry of the age, the best exemplar of American skill, energy and enterprise extant.

Watchman, Tell Us of the Comstock.

What Its Signs of Promise Are.

Querist, o'er you mountain hight see that dim, misguiding star and you will gain all the light vouchsafed the watchman or other outsider on this bewildering and oracular subject. Judging from what seems to be going on here in San Francisco, there impends a boom in the shares of the great Washoe lode. About the pool speculative are to be seen many waiting for the angel to come down and stir the waters, when they hope to step in and be cured of the financial itch and other ailments that afflict, and the anxious-seat in the Temple of Mammon appears also to be filling up mostly with old mourners who, sick and decrepit, have been there before.

Because the prices of stocks are depressed, it is not to be inferred that the bottom has fallen out of the mines, but the rather that something valuable is likely soon to be revealed there. The actions of the adroit manipulator are to be construed by the rule of contraries. He hears the market when he would load up, and boosts it when he would unload. Writing of him in strain Hudibrastic, it may be said:

> "He greatly resembles the skillful rower
> Who looks one way and pulls the other.
> So sell your shirt and buy some shares,
> Jump in with the 'bulls' and 'bears,'
> And trusting to a lucky stroke,
> Make your fortune or get broke."

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING DEC. 2, 1890.

442,003.—BOOT-CALK—A. J. Armstrong, Coronado, Cal.

442,006.—CRUSHING-ROLL.—H. C. Behr, S. F.

441,863.—NIGHT DIRECTORY—Henry Bergstein, Reno, Nev.

441,937.—BURIAL APPARATUS—G. H. Clark, Sacramento, Cal.

441,869.—HOOP-COUPLING—L. R. Fulda, S. F.

441,871.—FRUIT-DRYING TRAY — Hammon & Sechrist, S. F.

442,088.—DOSE-MEASURING BOTTLE — H. S. Herrick, S. F.

441,763.—VAPOR BURNER—C. W. Ingraham, Eight Mile, Or.

441,690.—FUMIGATOR—A. McLain, San Diego, Cal.

441,965.—PROPULSION OF VESSELS—S. A. Owen, West Berkeley, Cal.

441,862.—STEAM BOILER—J. & W. Paterson, Stockton, Cal.

441,859.—FRUIT-GATHERER — Florian Stanke, S. F.

441,861. — COIN-ACTUATED LIQUID-VENDING MACHINE—Vansant & Eames, Dixon, Cal.

The following brief list by telegraph for Dec. 9, will appear more complete on receipt of mail advices:

California—Almon Ames, Berkeley, assignor to R. J. Davis, San Francisco, machine for turning and preparing piles or spars; Walter M. Axtell, Fruitvale, railway crossing; Joseph Budde, San Francisco, supply valve for water closets; Adam Harpold, Colton, tree transplanter; David B. James, San Francisco, miners' candlestick; Joseph B. Jardine, San Francisco, apparatus for reducing, laying and rolling bituminous rock, asphalt, etc.; William H. Leavens, San Francisco, door-opener and closer; Duncan F. McDonald, Berkeley, device for adjusting window curtains; William F. Murray, San Francisco, portable hoisting mechanism; David Stark, San Francisco, feed-water heater. Oregon—Samuel T. Harrison, Skipanon, dressing and thread-cutting tool; Matthias Jensen, assignor of one-half to Jensen Canfilling Machine Co., Astoria, can body-making machine; George H. Williams, assignor of one-half to R. D. Montague, Albany, car-coupling. Washington—Otto F. Wegner, Seattle, shelf support.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

COIN-ACTUATED LIQUID-VENDING MACHINE.—William Sherman Van Sant and Edmund Curtis Eames, Dixon, Cal. No. 441,861. Dated Dec. 2, 1890. This machine is one from which, upon the deposit of a suitable coin, a certain article is delivered. The object of the machine is to provide for the keeping of one or more beverages, a tumblerful of any one of which will be delivered to the customer upon the deposit by him of a proper coin. The machine coosists essentially of one or more vessels for containing the liquids, a tilting measuring cup for each vessel, into which the liquid is conveyed by means of an automatically operating pipe connection, a discharge funnel to receive the contents of the tilting measuring cup, and an electrically operated catch for holding and tripping the tilting cup, the electric mechanism being set in operation by the deposit of the coin.

STEAM BOILER.—James Paterson, Stockton, and William Paterson, Benicia, Cal. No. 441,852. Dated Dec. 2, 1890. This invention relates to certain improvements in steam boilers, and consists of horizontal and vertical sections detachably connected together, a means for supplying the feed-water through the vertical section to the horizontal one, and a supplemental connection between the two whereby water may be supplied in case of temporary failure of the feed-water apparatus,

FRUIT-DRYING TRAY.—Wendell P. Hammon, Oaklaod, and Charles J. Sechrist, San Francisco, Cal. No. 441,871. Dated Dec. 2, 1890. This tray consists of a frame having a perforated paper bottom and a spring-actuated bar for holding the bottom in place. The paper bottom rests upon a wire netting or frame. The perforations in the bottom permit free circulation of air, and the fruit will be dried both from above and below. When soiled, the paper bottom can readily be removed and another substituted.

HOOP-COUPLING. — Lamartine R. Fulda, San Francisco, Cal., assignor of one-half to Edward Fulda, of same place. No. 441,869. Dated Dec. 2, 1890. This is an adjustable coupling for tank hoops. It consists of a clamp formed of screw-eye bolts bent and connected in such a manner that the ends of the hoop may be attached to it, and whenever the hoop becomes loose it may be tightened by screwing up the clamp. There are two screw bolts, each having one end threaded and the other bent at right angles and formed with an eye to receive the threaded end of the opposite bolt, the bent ends being adapted to pass through and hold the looped ends of the hoop.

NIGHT DIRECTORY.—Henry Bergstein, Reno, Nev. No. 441,863. Dated Dec. 2, 1890. The object of this invention is to provide a directory adapted for the use of physicians, whereby their presence or absence from the house may be made known to the caller at night without requiring him to disturb the household to learn such fact, and also to better indicate the position of the night-bell and to give an opportunity to leave such orders as may be necessary. It consists essentially of a transparent slate adapted to be written upon, and illuminated by a source of light from a point back of it. The intervening and changeable placards are also translucent and illuminated.

FRUIT GATHERER.—Florian Stanke, San Francisco, Cal. No. 441,859. Dated Dec. 2, 1890. This device belongs to that class of pruning shears and fruit-pickers or gatherers in which the shears are fitted to the end of a long pole, and are adapted to cut the branches or stems of the fruit, the fruit then dropping into a hopper on the head of the pole directly underneath the shears, and is directed by a suitable conveyor to a receptacle below. The object of this invention is to provide a device of this character which is adapted to cut fruit conveniently, no matter in what position it may be located, and to convey it below without bruising it, and also to provide a shears not only adapted for the picking of fruit, but for general pruning purposes. The essential improvement lies in the shears, which are formed with opposing jaws in line with the handles, and a second set of opposing jaws extending from the ends of the first jaws and at an angle therewith. This peculiar construction enables the shears to reach both horizontal and vertical stems conveniently. The mouth or hopper of the conveyor is made with a barred or grated open front, so that the operation of the shears may be readily seen. The conveyor itself has a tortuous passage which serves to break the fall of the descending fruit.

A Government Spraying Device.

B. T. Galloway, Chief of the Division of Vegetable Pathology, U. S. Department of Agriculture, has devised an apparatus for spraying plants which need the application of fungicides or insecticides. Although it seems a small affair from a California point of view, and though the Californian would object on principle to packing on his back the bug and fungus medicine, the arrangement may prove of much value to our people who have to deal with diseases or insects affecting vines, nursery stock, garden plants and other low growths which can be best reached by a man walking among them. Apparently because of the large need for such application at the East, what is called the "knapsack sprayer" seems to best answer the demand. In this State the larger outfits, so contrived that the horses can move the weight, leaving the men free to handle the nozzles, will not only be used for work among trees, but will also be employed among vines and wherever else it may be practicable. Still the hand machine has important uses, and we publish the device of Prof. Galloway because it is public property and any one is at liberty to manufacture it for private use or for sale.

THE KNAPSACK SPRAYER IN OPERATION.

The figure shown herewith will give a very good idea of the apparatus in use. It will be seen that there is a pump connected with the apparatus which is contained within the reservoir and worked by the right hand while the nozzle is held in the left. The reservoir will contain about six gallons of any kind of mixture which it may be desirable to use, which is about as much as any ordinary man will care to handle. The entire weight of mixture and apparatus, when the reservoir is full, is about 50 pounds. This weight may be reduced by placing less liquid in the reservoir. It is not necessary that we should illustrate or go into any detailed description of the construction of this apparatus. It is sufficient to say that it is perfect and effective in operation and simple and durable in construction.

Recent Additions to the State Mining Bureau.

Lead ore, Thompson mine, Old Woman's Mountain, San Bernardino Co., Cal.

Gold quartz with free gold, McGowan mine, Mineral Township, Plumas Co., Cal.; S. S. Taylor.

Gold quartz (auriferous arsenical pyrite), North Star mine, Amador Co., Cal.; Dr. Boyson.

Gold quartz with free gold, Halstead mine, Rich Gulch, Plumas Co., Cal.; S. S. Taylor.

Manganese ore (pyrolusite), near Freestone, Sonoma Co., Cal.; W. J. Woodley.

Three specimens silver ore, one from each of the following mines: The Excelsior, the Mayflower and the Keystone, San Bernardino Co., Cal.

Electrum, Liberia, Africa; J. Z. Davis.

Two specimens Molave wood, very rare.

Marcasite (sulphide iron), variety "spear pyrite" on serpentine, Napa Co., Cal; H. Gesford.

Aluminum bronze, al., 10 per cent, cop., 90 per cent, said to have been made at Lockport, N. Y., by the Cowles Co., in 1885, by fusing granulated copper with crushed corundum by electricity; W. P. Lyle.

Silver ore, Moulton mine, Butte, Montana; C. L. Canfield.

Ore with native silver from the Butte & Boston mine, Butte, Montana; C. L. Canfield.

Sphalerite (sulphide zinc), Butte, Montana, C. L. Canfield.

Two specimens silver ore from the Noonday and the Attica mines, Resting Springs District, San Bernardino Co., Cal.

Specimens silver ore from the Holland mine, Holcomb valley, San Bernardino Co., Cal.

Horn spoon, made by Indians of British Columbia; J. Z. Davis.

Adz or chisel of black slate, made by Indians of British Columbia; J. Z. Davis.

Pyrrholite, magnetic pyrite with traces of copper and nickel, large deposits on Elk Ridge, Humboldt Co., Cal.; J. B. Brown.

Spear head of chert, Cape Smith, Alaska, with various curios, utensils and Esquimaux implements, from the same locality; F. Cotto.

Gold quartz from croppings and upper ledge of the Gold Mountain M. Co., near Amador City, Amador Co., Cal.; J. L. Goodman.

Liparite tufa, Calistoga, Napa Co., Cal. (Calustro rock) gold quartz, Duncan mine, Hornitos, Mariposa Co., Cal.; J. B. Brown.

Ferruginous concretions, with a rude carving, probably an Indian amulet, Taylor mountain, near Santa Rosa, Sonoma Co., Cal.; J. R. Stanley.

Slate, silicious, somewhat resembling novaculite, makes a good whetstone, Kings Island, Behring's Straits; F. Cotto.

Gold quartz showing free gold, Fred Lewis mine, Rich Gulch, Plumas Co., Cal.; S. S. Taylor.

Gold quartz showing free gold from an old placer mine near the Veragua river, Isthmus of Panama, worked before the discovery of this continent by Columbus, who entered this river on his fourth voyage in 1503, and visited these mines, it being from this event that he obtained his title of Duke of Veragua; W. P. Lyle.

To some of the above articles there attaches a special interest because of their intrinsic value, their rarity or their utility. The fragment of silicious slate brought from Behring's Straits, constitutes the first rock found on the west side of the continent suitable for making whetstones, or at least the first of which samples have been received at the Mining Bureau, this being especially well adapted for that purpose,

Importance of Gold Mining in California.

EDITORS PRESS:—Your article giving the estimated valuation of the annual products of the mines in California was so highly appreciated that it appeared in most of the papers in the county. But few were aware that the mining industry was still so valuable and extensively conducted or that so great a number were engaged in the business. The estimate conclusively shows that mining still contributes immensely to the revenue of the State and that it must be a remunerative and profitable pursuit. The fact is, this branch of industry and source of wealth is not receiving the attention and encouragement it so justly deserved.

Of late years the planting and cultivation of orange groves, orchards and vineyards has so completely absorbed the minds of the people and that of the press that the first chief cause of the State's prosperity is at present overlooked. In this county there should be hundreds, if not thousands, of good producing mines instead of the comparatively few we have, and there certainly would be if capitalists at home and abroad were suitably advised or could be induced to visit the gold-bearing districts and see for themselves what is being accomplished by the present methods of mining, its future prospects and possibilities.

It is believed that in this and adjoining counties where valuable mines are now being worked, there are extensive and rich gold-bearing regions, that remain undeveloped simply for the want of water or some other agency or device capable of working them.

A new system of mining, called the Freedman's "dry process," is being erected near Iowa Hill. The work will be completed some time next spring, when the "dry process" for extracting the gold from the gravel will be in full operation. Should it prove a success, large quantities of water will be no longer required, so that capital and labor need not be confined to any particular locality, but go wherever the precious metal can be found or is known to exist.

To-day there is probably no more important or valuable industry in the State than that of mining, if properly conducted. To be sure, there are some failures, as there are in other pursuits, but it is to be found generally attributable to the want of capital or experience to carry it successfully on. Hereabout, there is every indication that a renewal of interest in this industry will soon take place. N. S. T.

Auburn, Cal., Dec. 5th.

The Population of the United States.

Robert P. Porter, Superintendent of the Census of 1890, has issued a preliminary bulletin of census results from which we take the following table showing the population of the United States in 1890, as compared with 1880 and 1870, by States and Territories. The figures for 1890 in this table are not final, but are subject to revision:

STATES AND TERRITORIES	POPULATION 1890.	1880.	1870.
The United States	62,480,540	50,155,783	38,558,371
North Atlantic Division	17,364,429	14,507,497	12,298,730
Maine	660,261	648,936	626,915
New Hampshire	375,827	346,991	318,300
Vermont	332,205	332,286	330,551
Massachusetts	2,233,407	1,783,085	1,457,351
Rhode Island	345,343	276,531	217,353
Connecticut	745,861	622,700	537,454
New York	5,981,934	5,082,871	4,382,759
New Jersey	1,441,017	1,131 116	906,096
Pennsylvania	5,248,574	4,282,991	3,621,951
South Atlantic Division	8,836,759	7,537,197	5,853,610
Delaware	167,871	146,608	125,015
Maryland	1,040,431	934,943	780,894
District of Columbia	229,796	177,624	131,700
Virginia	1,648,911	1,512,565	1,225,163
West Virginia	760,448	618,457	442,014
North Carolina	1,617,340	1,399,750	1,071,361
South Carolina	1,147,161	995,577	705,606
Georgia	1,834,366	1,542,184	1,184,109
Florida	399,435	269,493	187,748
Northern Central Div'n	22,322,151	17,364,111	12,981,111
Ohio	3,666,719	3,198,062	2,665,260
Indiana	2,189,030	1,978,301	1,680,637
Illinois	3,818,536	3,077,871	2,539,891
Michigan	2,089,792	1,636,937	1,184,059
Wisconsin	1,683 697	1,315,497	1,054,670
Minnesota	1,3.0,017	780,773	439,706
Iowa	1,908,729	1,624,615	1,194,020
Missouri	2,677,080	2,168,380	1,721,295
North Dakota	182,425	36,909	} 14,181
South Dakota	327,848	98,268	
Nebraska	1,056,793	4 2,102	122,993
Kansas	1,423,485	996,096	364,399
Southern Central Div'n	10,943,253	8,919,371	6,434,410
Kentucky	1,845,436	1,648,690	1,321,011
Tennessee	1,763,723	1,542,359	1,258,520
Alabama	1,508,473	1,262,505	996,992
Mississippi	1,284,837	1,131,597	827,922
Louisiana	1,116,828	939,946	726,915
Texas	2,232,220	1,591,749	818,579
Indian Territory (b)	.....	.....	.....
Oklahoma	61,701	.....	.....
Arkansas	1,125,385	892,525	484,471
Western Division	3,008,948	1,767,697	990,510
Montana	131,759	39,159	20,595
Wyoming	60,989	20,789	9,118
Colorado	410,975	194,327	39,864
New Mexico	144,862	119,565	91,874
Arizona	59,691	40,440	9,658
Utah	206,498	143,963	86,786
Nevada	44,327	62,266	42,491
Idaho	84,229	32,610	14,999
Alaska (d)	.....	.....	.....
Washington	340,516	75,116	23,955
Oregon	312,490	174,768	90,923
California	1,204,002	864,694	560,247

b The number of white persons in the Indian Territory is not included in this table, as the census of Indians and other persons on Indian reservations, which was made a subject of special investigation by law, has not yet been completed.

c Including 5337 persons in Greer county (in Indian Territory) claimed by Texas.

d The number of white persons in Alaska is not included in this table, as the census of Alaska, which was made a subject of special investigation by law, has not yet been completed.

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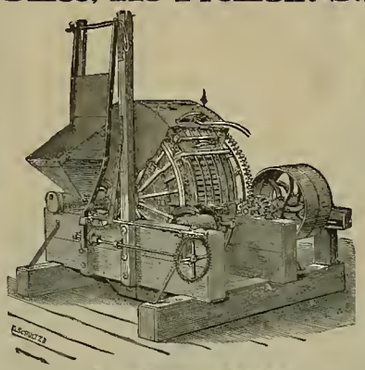

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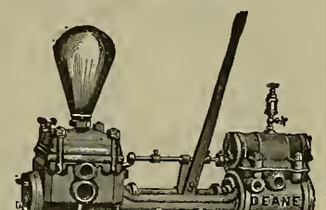

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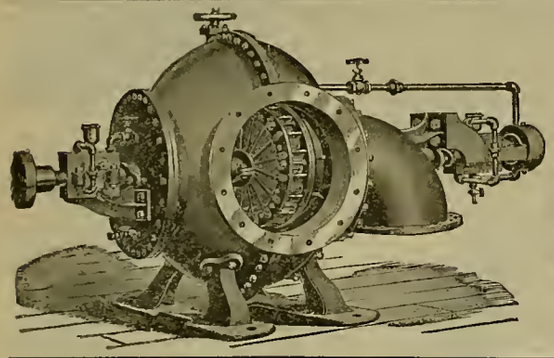

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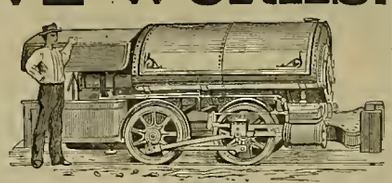

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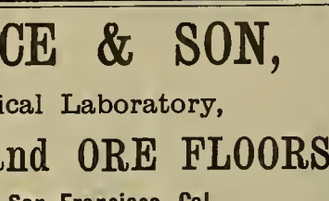

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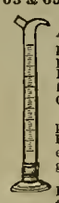

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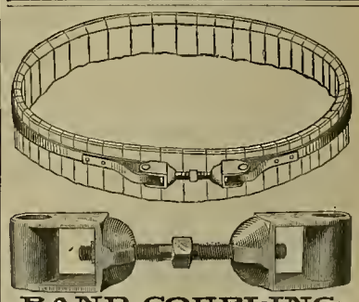

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 11, 1890.

General trade is quiet, with no improvement looked for until after the turn of the year. The local money market, while reported close, is not working with as much friction as it did in December of last year. The stringent money market at the East is not having as much influence on ours as would naturally be supposed when the close business relations are considered. From the best information obtainable, we unhesitatingly affirm that the disbursements of funds in this city next month will be the largest on record; and as the money goes into circulation, more general ease will result. Leading Eastern financial papers are of one accord in stating that the disbursements at the East will be very heavy, and that the gold now hoarded to meet the payments will be circulated soon after January 1st. Besides this, it is quite likely that public opinion will force Congress to stop partisan or political legislation and come to the relief of the country by passing a free-coinage silver bill.

The British steamer Gaelic, hence Dec. 6 for Hong Kong, took out the following treasure: Mexican dollars, 328,797; gold coin, $39,882; gold dust, $1070.

SILVER—Offerings, purchases and prices paid so far this month are as follows:

Date	Offered ounces.	Purchased ounces.	Price paid per ounce.
December 1....	891,000	566,000	$1 0075 to $1.0760
December 3....	1,301,000	321,000	1.0545 to 1.0595
December 5....	1,080,000	255,000	1 0400 to 1.0500
December 8....		685,000	1.0280 to 1.0350
December 10....	783,500	395,000	1.0300 to 1.0447
Total	2,222,000		

Adding purchases over the counter, it is altogether likely that a little more than half of the monthly requirements has been bought. Silver, after selling down below $1.03 an ounce, appears to be on the upgrade. The general impression that a free-coinage bill will be passed by this Congress has a favorable influence on the market, as has also the selling out of weak holders of silver. The production of silver in this country is not as large as many believe—the silver bill now in force did not prove as effective in reviving the mining industry as its authors had been led to look for. The silver men at the East, headed by Gen. Warner, Hon. F. G. Newlands, Edward Curtis and other staunch bimetallists, are leaving no stone unturned to bring about the passage of a free-coinage bill before Congress adjourns. It now looks as if they will be successful. In our next week's issue we will probably be better informed on the situation and can write more correctly on the outlook.

London cables report silver selling at 48d, against 47¾d yesterday.

MEXICAN DOLLARS—Trading has been fair. The belief that Congress will legislate still further in the interest of silver is causing more buying. The market is quoted at 82½@83c.

QUICKSILVER—Receipts the past week aggregate 150 flasks. The market is quiet but steady.

LIME—Receipts the past week aggregate 4923 bbls. The demand continues exceptionally good for the time of the year. Exports by sea the past week aggregate 800 bbls. to Honolulu.

BORAX—Receipts the past week aggregate 210 ctls, and shipments by sea 373 ctls to New York. The market is quiet but firm.

LEAD—The market is still shading off. Those who bought some time ago, in expectation of higher prices after the McKinley bill went into effect, have lost money.

TIN—The local market is dull and heavy. It now looks as if Congress will reduce the tariff on plate and continue pig on the free list. The market for pig abroad has been shading off. The buying of plate for this city is about over.

CHROME ORE—Exports the past week aggregate 295 tons to New York. The market is steady.

COPPER—The exports by sea the past week aggregate 196¼ tons of matte to New York. The market has shaded off some both in New York and abroad. The decline is due more to outside holders selling owing to the stringency in the money market, than to any other cause. The visible supply is steadily decreasing, which, with all else being equal, should bring about higher prices.

IRON—The local market is steady. It is stated that the quantity on the way from England is very large, which causes buyers to be offish.

COAL—Imports the past week aggregate as follows: Nanaimo, 7465 tons; Seattle, 6921; Port Townsend, 1050; Kobe, 2150; Cardiff, 1698; Coos Bay, 700; Wellington, 1340; Tacoma, 8950; total, 30,274 tons. The quantity of coal on the way from England to this port is unusually large. Vessels loading coal in Australian ports for this city are receiving quick dispatch. A good deal of Japan coal is on the way. With so much foreign coal on the way, coast collieries are disposed to send all the supplies to this city they can so as to take advantage of present high prices. Cold weather has increased the consumption. Australian coals on the way from Newcastle, N. S. W., can be bought at $8, while for shipment loaders' prices are named.

San Francisco Metal Market.

WHOLESALE.

THURSDAY, December 11, 1890.

ANTIMONY	@ 21
BORAX—Refined, in carload lots	8 @ —
Powdered " " "	8 @ —
Concentrated " " "	7½@ —
All grades jobbing at an advance.	
COPPER—	
Bolt	23 @ 25
Sheathing	23 @ 25
Ingot, jobbing	20 @ —
do, wholesale	18 @ 18½
Fire Box Sheets	23 @ 25
LEAD—Pig	5½@ —
Bar	6½@ 6¾
Sheet	7½@ —
Pipe	6½@ —
Shot, discount 10% on 500 bags Drop, ₱ bag	1 90 @ —
Buck, ₱ bag	2 10 @ —
Ohilled, do	2 30 @ —
QUICKSILVER—By the flask	63 60 @64 00
Flasks, new	— @ —
Flasks, old	45 @ 65
CHROME IRON ORE, ₱ ton	10 00 @— —
STEEL—English, lb	16 @ 20
Caulton tool	9 @ 9
Black Diamond tool	9 @ 9
Pick and Hammer	8 @ 10
Machinery	4 @ 5
Toe Calk	4½@ —
TINPLATE—B. V., steel grade, 14x20, to arrive	— @ —
B. V., steel grade, 14x20, spot	6 12½@ 6 25
Charcoal, 14x20	6 50 @ —
do roofing, 14x20	6 00 @ —
do, do, 20x28	13 00 @ —
Pig tin, spot, ₱ lb., nominal	23½@ 24
IRON—Bar, base	3 @ 3½
Norway, base	4½@ 5½
	Spot. To Load.
IRON—Glengarnock ton	34 00 @— — 30 @ —
Eglinton, ton	34 00 @— — 30 @ —
American Soft, No. 1, ton	— — @32 00 33 @ —
Oregon Pig, ton	— — @33 00 — @ —
Puget Sound	34 00 @— — — @ —
Bar Iron (base price) ₱ lb	— @ — — @ —
Clay Lane White	— — @28 00 26 @ —
Shotts, No. 1	34 00 @35 00 32½@ —
Langloan	34 00 @— — 30 @ —
Thorncliffe	34 00 @— — 30 @ —
Gartsherrie	34 00 @— — 30 @ —
Barrow	34 00 @— — 30 @ —
Thomas	34 00 @— — — @ —
Cargoffeet	30 00 @— — 26 @ —

Sales at San Francisco Stock Exchange.

THURSDAY, December 11, 9:30 A. M.

100 Alpha Con	1.05	100 Julia	20c
100 Andes	80c	50 Kentuck	1.10
100 Belcher	1.75	250 Mexican	2.55
200 Belle Isle	50c	200 North Belle Isle	80c
100 Best & Belcher	2.40	400 Ophir	3.50
100 Bodie	9c	100 Overman	1.90
450 Bullion	1.35@1.90	100 Peerless	20c
50 Caledonia	35c	300 Potosi	5.12½@5.25
430 Chollar	2.70@2.80	460 Savage	1.65
150 Con Cal & V	3.10	200 Seg Belcher	1.10
400 Con Imperial	20c	100 Sierra Nevada	1.90
120 Con New York	1c	50 Union Con	2.00
100 Crocker	20c	300 Utah	55c
150 Crown Point	1.50	100 Weldon	15c
100 Exchequer	65c	400 West Comstock	45c
50 Hale & Norcross	1.55		

Coal and Coke.

SPOT FROM YARD—PER TON.		TO LOAD—PER TON.	
Wellington	$14 00	Australian	$ 8 00@— —
Greta	14 00	Liverpool St'm.	8 50@— —
Carbou Hill	9 00	Scotch Spliut.	8 60@ 9 00
Nanaimo	11 00	Cardiff	8 50@— —
Gilman	11 00	Lehigh Lump.	15 50@17 00
Seattle	11 00	Cumberland bk	13 50@— —
Coos Bay	9 00	Egg, hard	15 00@— —
Cannel	16 00		
Egg, hard	16 00	**Coke—Englisb.**	
Cumberland, in sacks	19 60		
do, bulk	18 00	To load	$12 00@13 00
Wallsend	13 00@14 00	Spot, in bulk	16 00@18 00

Eastern Metal Markets.

By Telegraph.

NEW YORK, December 10.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	47⅞	1 04½	$16 00	$4 65	$20 85
Friday	47⅞	1 04½	16 95	4 65	21 50
Saturday	47⅞	1 03¾	16 00	4 50	21 60
Monday	47⅛	1 02½	16 00	4 37½	21 60
Tuesday	47¼	1 02	15 76	4 26	21 40
Wednesday	47⅜	1 03½	15 50	4 15	21 20

NEW YORK, December 8.—Copper continues slow; only outside holders are selling. Mine owners look for an improvement after next month. Lead continues to sink. Tin is easing off. Quicksilver is barely steady.

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 20.	WEEK ENDING Nov. 25.	WEEK ENDING Dec. 4.	WEEK ENDING Dec. 11.
Alpha	1.10 1.40	1.25 1.35	.95 1.30	.90 1.05
Alta	.90 1.25	.95 1.10	.90 1.10	.80 .90
Andes	.80 .95	.85 1.15	.80 1.00	.80 .85
Belcher	1.30 2.20	1.90 2.45	1.80 2.25	1.70 1.90
Best & Belcher	2.35 2.75	2.40 2.85	2.20 2.48	2.20 2.45
Bullion	2 15 2.60	2.35 2.60	1.75 2.30	1.55 2.10
Bodie Con	.65 1 25	.75 .90	.90 1.10	.85 .90
Bulwer	.20 .40	.20 .25	....	.20 ....
Commonwealth	2.50 2.65	2.30	1.90 2.35	1.25 2.00
Con. Va. & Cal	3.35 3.85	3.60 3.90	3.15 3.60	3.05 3.20
Challenge	2.10 2.60	2.30 2.50	2.05 2.30	1.80 2.15
Chollar	3.35 3.60	3.45 3.70	3.75 3.95	3.25 3.35
Confidence	4.25 6.75	4.85 5.50	....	4.60 4.70
Con. Imperial	.25 *.30	.25 .30	.25 .30	.20 ....
Caledonia	.25 .30	.30 .35	.35	.30 .40
Crown Point	1.65 2 20	1.70 2.15	1.55 2.10	1.50 1.70
Crocker	.20	....	....	.20 ....
Del Monte	.60 .70	.60 .75	....	.50 ....
Eureka Con	3.50	3.75	3.75	....
Exchequer	.70 .95	.75 .95	.65 .85	.60 .73
Grand Prize	.25 .30	.25 .30	.30	.20 .25
Gould & Curry	1.55 2.00	1.65 1.85	1.15 1.75	1.50 1.85
Hale & Norcross	1.95 2.20	1.95 2.20	1.60 2.00	1.40 1.75
Julia	.15 .25	.15 .20	.20 .30	.15 .20
Justice	1.05 1.25	1.10 1.30	1.10 1.15	1.05 1.15
Kentuck	1.10 1.45	1.30 1.55	1.10 1.50	1.05 1.25
Lady Wash	.30 .35	.25 .35	.30	.25 ....
Mono	.40 .65	.50 .60	.60 .70	.55 ....
Mexican	2.15 2 50	2.45 2.90	2.50 2.70	2.45 2.75
Navajo	.30 .40	.30 .33	.35	.25 ....
North Belle Isle	1.10 1.30	1.20 1.25	1.00 1.30	.70 .90
New Queen	.85 .90	.90	.75 .90	.50 .60
Occidental	.90 1.15	1.00 1.20	.90 1.15	.85 .95
Ophir	3.00 3.80	3.70 4.00	3.65 3.80	3.50 3.60
Overman	1 65 1.95	1.65 2.00	2.00 2.50	1.85 2.05
Potosi	6.25 7.00	6.62 7.00	4.70 6.50	3.80 6.50
Peerless	.15 .20	.23 .25	.20	.25 ....
Peer	.15 .20	.20	.15	.10 .20
Savage	2.00 2.40	2.05 2.45	1.85 2.30	1.50 1.95
S. B. & M	1.10 1.35	1.10 1.40	1.10 1.35	1.05 1.10
Sierra Nevada	2.05 2.45	2.05 2.35	2.00 2.20	1.80 2.10
Silver Hill	.25 .30	.30 .35	.25 .30	.20 .25
Scorpion	.20	....	.20	.20 ....
Union Con	2.05 2.30	2.10 2.30	2.00 2.20	1.90 2.15
Utah	.55 .80	.65 .85	.65 .75	.60 .70
Yellow Jacket	2.10 2.50	2.15 2.60	2.10 2.50	2.05 2.20

* Assessment delinquent.

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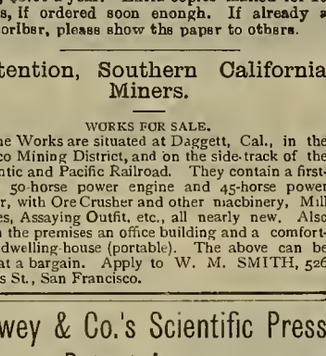

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ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELINQ'T. SALE.	SECRETARY.	PLACE OF BUSINESS.
Atlantic Con M Co	Nevada	7	25	Nov 19	Dec 29	Jan 19 D M Kent 330 Pine St
Confidence Silver M Co	Nevada	17	75	Nov 17	Dec 22	Jan 12 A S Groth 414 California St
Con New York M Co	Nevada	4	15	Nov 12	Dec 17	Jan 6 C E Elliott 309 Montgomery St
Crown Point M Co	Nevada	53	50	Dec 3	Jan 7	Jan 28 James Newlands 331 Pine St
Gray Eagle M Co	California	20	6	Oct 20	Nov 24	Dec 15 J M Buffington 303 California St
Guasacaran & Cal M & M Co	Honduras	3..10	00	Oct 28	Nov 28	Dec 16 Edward Oliver 22 Michigan Ave, S F
Leigh Gravel M Co	California	2	5	Nov 22	Jan 3	Jan 24 E E Fall 320 Sansome St
Morgan M Co	California	14	10	Oct 30	Dec 6	Dec 29 L C Bresse 230 Montgomery St
Northwestern G & S M Co	Br Columbia	1	5	Nov 12	Dec 19	Jan 13 E Bonacina 438 California St
Utah Con M Co	Nevada	11	25	Dec 9	Jan 19	Feb 9 A H Fish Nevada Block

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Andes S M Co	Nevada	J W Twiggs	Nevada Block	Annual	Dec 13
Contra Estaca Con M Co	Mexico	George Gale	Nevada Block	Annual	Dec 15
Kiko Cua M Co		W P Loy	310 Pine St	Annual	Dec 15
Gould & Curry S M Co	Nevada	A K Durbrow	Nevada Block	Annual	Dec 15
Ophir S M Co	Nevada	E B Holmes	Nevada Block	Annual	Dec 17

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico	G Gale	309 Montgomery St	25	Dec 3
Commonwealth M Co	Nevada	R R Grayson	331 Pine St	20	Nov 20
Eureka Cons M Co	Nevada	H P Bush	306 Pine St	25	Aug 5
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Dec 10

Assessment Notices.

LEIGH GRAVEL MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 22d day of November, 1890, an assessment, No. 2, of five cents (5c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, 320 Sansome Street, Room 57, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 3d day of January, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on SATURDAY, the 24th day of January, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

E. E. FALL, Secretary,
Office, 320 Sansome Street, Room 57, San Francisco, California.

DELINQUENT SALE NOTICE.

GRAY EAGLE MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice—There are delinquent upon the following described stock, on account of Assessment (No. 20) levied on the 20th day of October, 1890, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
Buffington, J M, Trustee	528	2,000	$120 00
Barrows, A W, Trustee	547	1,000	60 00
Bowers, D	379	20	1 20
"	404	500	30 00
Bogart, O H, Trustee	488	105	6 30
Carnes, W A	252	410	24 96
Francis, H L, Trustee	444	1,600	9 00
Nash, H W	269	104	0 24
Nordman, Leon	514	100	6 00
Rosekrans, H M	39	600	36 00
Stout, C S, Trustee	476	2,000	120 00
" " "	477	953	57 18
Scarles, W A, Trustee	618	1,000	60 00
Stetson, A M, Trustee	520	5 000	300 00
Taylor, J N, Trustee	532	1,040	62 40

And in accordance with law, and an order of the Board of Directors, made on the 26th day of October, 1890, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 11, No. 303 California street, San Francisco, California, on MONDAY, the 16th day of December, 1890, at the hour of one (1) o'clock P.M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

A. W. BARROWS, Secretary pro tem.
Office, Room 11, No. 303 California street, San Francisco, California.

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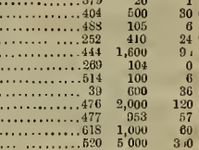

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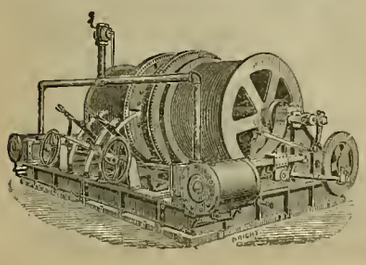

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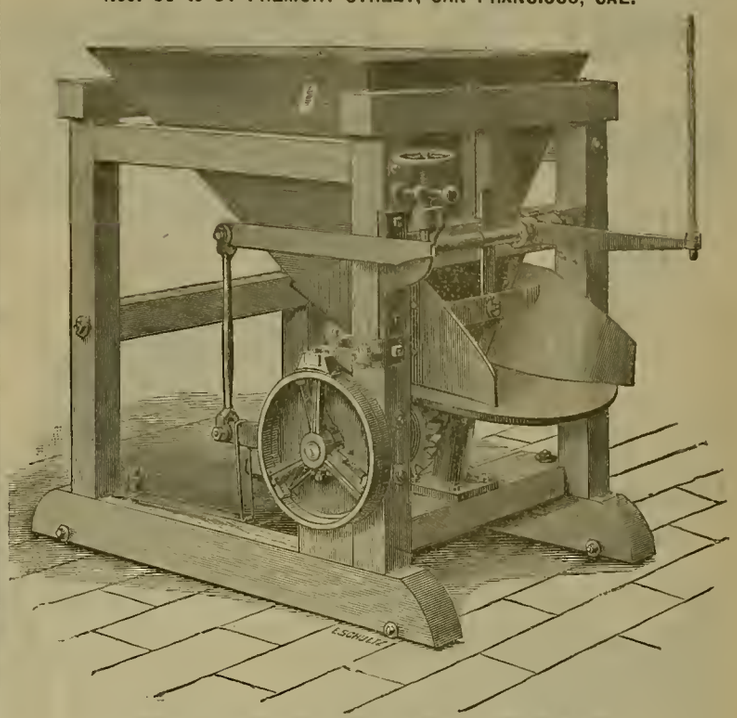

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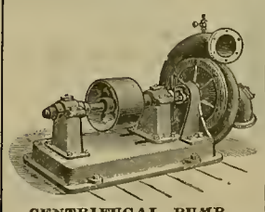

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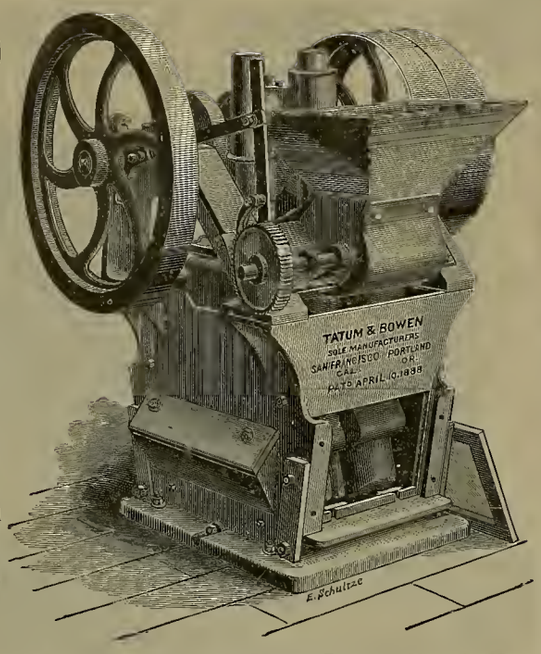
Quartz

Mill.



Attached to each Mill is an effective

Automatic Ore Feeder.

RAILROAD FLAT, CAL., May 15th, 1889.

MESSRS. TATUM & BOWEN, San Francisco—GENTLEMEN: I have had many inquiries in regard to the performance of your oscillating Stamp Quartz Mill, to all of which I have made substantially the following answer:

That it will crush and discharge through a No. 30 mesh wire screen, 6 tons of average quartz per 24 hours; that, compared with the common stamps, the power required to do the same amount of work is considerably less—the slipping motion of the stamps reducing the ore much faster than the drop alone can; that the discharge is good, and as to amalgamating and saving gold, my experience with it is that it is just about the same as the ordinary battery.

To the above I shall add that the new Automatic Feed attached is a perfect success. It can, in a moment and without stopping, be adjusted to feed just as "high" or "low" as desired, and can be depended upon to supply the stamps with ore exactly as they need it. This is important, as it saves feeding by hand, which cannot be considered at the present day, or the purchase of a high-priced feeder.

Considered as a convenient Mill for prospecting, or for a small mine, it fills the bill.

Yours truly, [Signed] JAS. S. REYNOLDS,
Supt. New York Mine, Railroad Flat.

The Mills as we make them now are Far Superior to the one at the New York Mine.

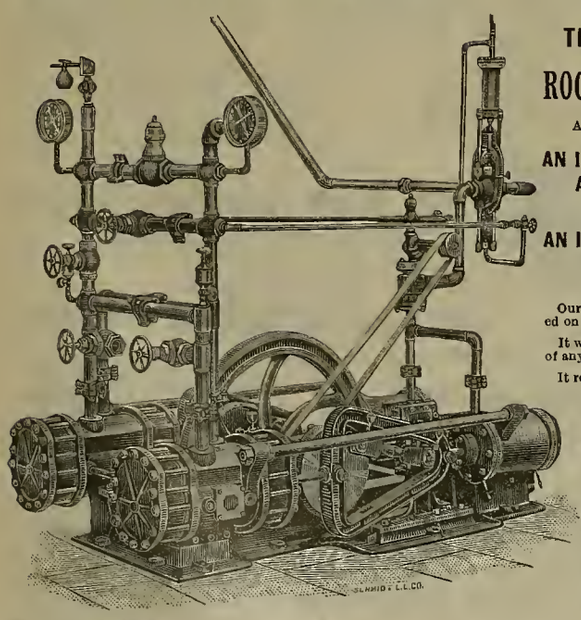
TATUM & BOWEN,

34 and 36 FREMONT ST., SAN FRANCISCO, CAL.,

AND PORTLAND, OREGON.

MANUFACTURERS OF MINING AND SAW MILL MACHINERY.

IMPORTANT TO MINING MEN AND R. R. CONTRACTORS.



The Cummings

ROCK DRILL CO.

Are manufacturers of

AN IMPROVED AIR COMPRESSOR

And also

AN IMPROVED ROCK DRILL.

Our Compressor is constructed on entirely new principles.

It weighs less than half that of any other of equal capacity.

It requires no Receiver.

There is no danger of overheating or freezing.

It is perfectly automatic in action.

Its first cost is less.

It saves in power required to run it from 25% to 50% over other systems.

It is especially adapted for running Pumps, Hoists, etc., etc.

For particulars as to price, etc., write to

THE CUMMINGS ROCK DRILL CO., 59-61 First St., San Francisco.

LEVIATHAN COTTON BELTING.

Superior to all Others for Quartz Mills, Smelters, &c.

Not Affected by Wet, Steam, Heat or Oils. Every Belt Guaranteed. Try It. Send for Circular and Samples.

NEVILLE & CO.,

27 TO 33 CALIFORNIA STREET, - - - SAN FRANCISCO, CAL.

L. C. MARSHUTZ T. G. CANTRELL.

NATIONAL IRON WORKS

N. W. Corner Main and Howard Sts., San Francisco,

—MANUFACTURERS OF—

Stationary and Compound Engines, Flour, Sugar, Saw and Quartz Mill Machinery.

AMALGAMATING MACHINES. CASTINGS AND FORGINGS Of Every Description

ALL WORK TESTED AND GUARANTEED.

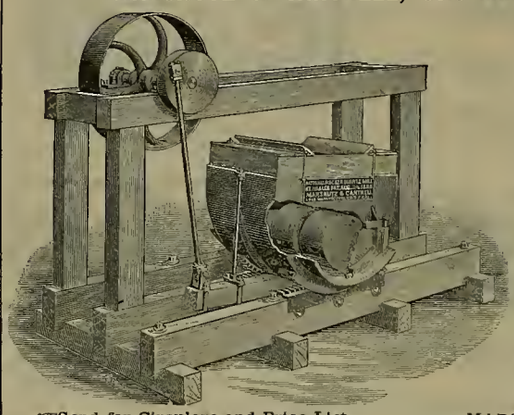
IMPROVED PORTABLE HOISTING ENGINES.

NATIONAL ROCKER QUARTZ MILL.

KENDALL'S PATENT, AUGUST 24, 1886.

CAPACITY, 12 Tons in 24 Hours. 3 H. P.

MARSHUTZ & CANTRELL, Sole Manufacturers.



The Patentee and Manufacturers cordially invite miners to critically examine and pass judgment upon this improved system of milling and amalgamating ores in the following particulars:

1. The cost is less than one-half of stamps of same capacity.
2. The freight to mine is less than one-half of stamps.
3. The cost of erecting is less than one-fourth of stamps.
4. The power to drive it is less than one-half of stamps.
5. The wear is less than one-quarter of stamps.
6. There is no wear except on shoes and dies.
7. In point of amalgamation it is superior to any other machine in use.
8. In its simplicity of construction.

We challenge competition with Stamps, Ball Pulverizers or and other ore crushing machines now before the public.

Send for Circulars and Price List. MARSHUTZ & CANTRELL.

THE "VULCAN"

ICE & REFRIGERATING MACHINERY

—FOR—

BREWERIES,
PACKING HOUSES,
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COLD STORAGE,
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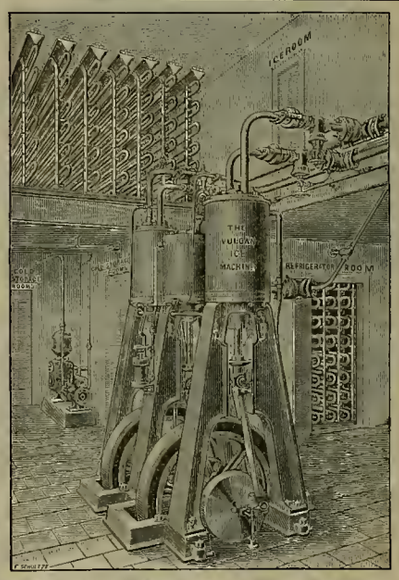

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The 25-ton Refrigerating Machine has been running continuously since 1887 and has proved economical and satisfactory in every respect.

HOTEL RAFAEL, San Rafael.

The "Vulcan" Ice and Refrigerating Plant is satisfactory in every respect, * * * * a model of good workmanship. The Ice is clear.

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VULCAN IRON WORKS, 135-145 FREMONT ST., SAN FRANCISCO.

A. J. VAN DRAKE,

Machinist and Mechanical Engineer,

203 Fremont St., San Francisco.

SPUR AND BEVEL GEARS CUT TO ORDER.

Patent Models

And Experimental Machinery of All Kinds

Shafting, Pulleys and Boxes, Engines and Boilers.

DRAWINGS, PLANS and SPECIFICATIONS made to new machinery.

Jobbing of every description promptly attended to. FINE WORKMANSHIP GUARANTEED.

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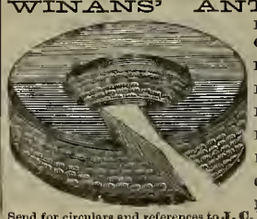

For Removing and Preventing Scale, Corrosion and Pitting in Steam Boilers.

Peerless Piston and Valve Rod Steam Packing.
Peerless Plumbago Sheet, Superior to "Usidurian."
Peerless Rainbow Sheet, will not harden under Steam.
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Manhattan Square Plumbago Piston Packing.
Gould's Combination Steam or Water Packing.
Magnolia Anti-Friction Metal, or any other article wanted in an Engine Room.

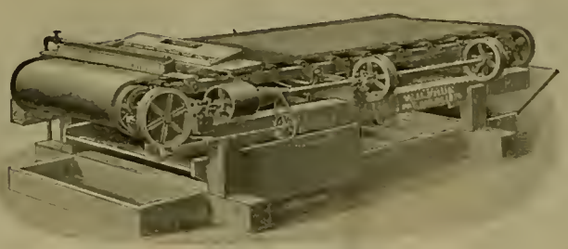
Send for circulars and references to J. C. WINANS, 220 FREMONT STREET, SAN FRANCISCO, CAL

IMPROVED BELT FRUE ORE CONCENTRATOR.

The Best Ore Concentrator in the market, having donble the Capacity and doing its work as olose as the plain Belt machine, while its oonoentrations are olean. It is used in a number of Mills, the most notable of which is the Alaska M. & M. Co's Mill, where 24 Improved Belt Frnes are taking the Pnlp from 120 Stamps, crnshing 350 tons per day, and is giving entire eatisfaction as against 48 plain Belt Machines, taking the Pnlp from tho other 120 Stamps.

Price of Improved Belt Frue Vanner, $825, f. o. b.
Price of Plain Belt Frue Vanner, $575, f. o. b.

For Pamphlets, Testimonials and further information apply at offioe.



Protected hy Patents Decemher 22, 1874; Septemher 2, 1879; April 27, 1880; March 22, 1881; Fehrnary 20, 1883; Septemher 18, 1883; Jnly 24, 1888. Patents applied for.

There are Over 2200 Plain Belt Machines now in Use.

THE MONTANA COMPANY (Limited), LONDON, October 8, 1885.
DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

ADAMS & CARTER, Agents FRUE VANNING MACHINE CO., Room 15, No. 132 Market Street, San Francisco, Cal.

"TRIUMPH" ORE CONCENTRATOR WITH IMPROVED RIFFLED BELT.

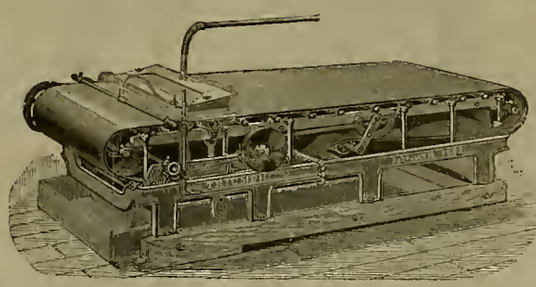
The competitive trials which have been held between the "Trinmph" Ore Concentrators, the "Frne" Vanners and other forms of concentrating devioes, do not warrant the assertion that the "Frue' Vanner is the hest ore oonoentrator in the market. The fact that the "Frues" have improved (corrngated) helts does not militate against the snperiority of tho "Triumphs;" for, when desired, they (the "Trinmphs") can he mounted with a snperior helt known as the "Blasdel" Riffled.

—o—

Price "Triumph" Concentrators, with Improved (Patented) Belt - - - $650 f. o. b.
Price "Triumph" Concentrators, with Plain Belt - - - - - - $550 f. o. b.

—o—

We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be.
Circulars and testimonial letters furnished on application.



JOSHUA HENDY MACHINE WORKS,
39 to 51 Fremont Street, San Francisco, Cal.

(PATENTED.)

Both the "Trinmph" Concentrator and "Blasdel" (riffled) Belt are protected hy incontestahle letters patent, granted hy the Government of the United States.

—o—

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Triumph" Ore Concentrators, that four (4) of them were placed in the mill of the Original Empire Mill and Mining Company in April, 1884, and a thorough test made of their practical oper tion; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vanners or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

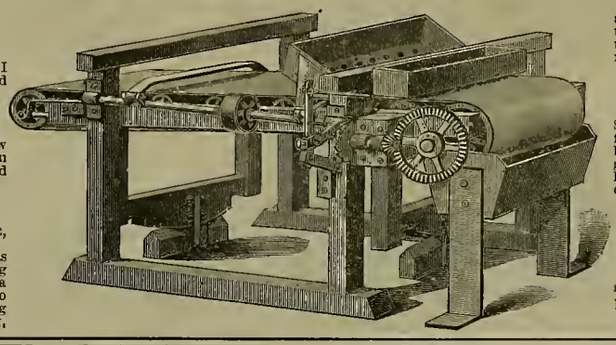
N. B. When the stamping capacity of the two above named mills was increased, more "Triumph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

TULLOCK IMPROVED ORE CONCENTRATOR.

Patented October 8, 1889, and December, 1890.

ANGELS, CALAVERAS COUNTY, NOV. 22, 1890.
JAMES TULLOCK, ESQ.—Dear Sir: I am pleased to state that I have used two (2) of your Sulphuret Concentrators in the Gold Cliff Mill, since the first day of last May, and that they have given entire and splendid satisfaction, concentrating the sulphurets from 60 tons of ore every 24 hours. Your Sulphuret Concentrators are superior to any that I have seen, being simple in action, positive in effect, admirable in construction, of few mechanical parts, and admirably adapted to the concentration of any kind of sulphurets. I therefore cheerfully recommend them to the mining fraternity. Respectfully yours,
WOODSON GARRARD, Supt. Gold Cliff Mine.

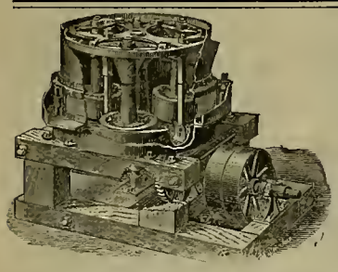
HELENA & IDAHO GOLD MINING CO, SUPERINTENDENT'S OFFICE, GIBBONSVILLE, IDAHO, Oct. 6th, 1890.
MR. JAMES TULLOCK, Angels, Cal.—Dear Sir: Mr. Arnold was saying the other day that you were talking something of coming up this way, and I have thought that perhaps you might be a little uneasy about your concentrators. You need have no anxiety about them whatever, as the one we set up is running all right and has not given a minute's trouble since starting, and the other one is all ready to start. They were so easy to set up and run that I forgot all about the "letter of instructions" until they were set up and running and you recalled to my mind your letter and instructions. Yours truly,
MYRON K. RODGERS, Supt.



ANGELS, CALAVERAS CO., NOV. 22, 1890.
JAMES TULLOCK, ESQ.—Dear Sir: We have used two of your Sulphuret Concentrators in the Madison Mill, (10) ten stamps, for over six months last past, and I hereby testify that they have given every satisfaction, and in every sense fulfilled the great opinion I had formed of their superiority. They are easily handled, readily kept in order, require but little watching, are exceedingly simple in construction and absolutely positive in their work. In my opinion, they are superior to any other in the market, doing effective work in the treatment of large quantities of sands. Sincerely yours, T. M. LANE.
Supt. Madison Mine.

Price, $350, delivered at Factory, Angels, Calaveras Co., or at Milton railroad station free of charge. For further particulars, address

JAMES TULLOCK, Angels, Cal.



Centrifugal Roller Quartz Mill.

F. A. HUNTINGTON.

MANUFACTURER OF

CENTRIFUGAL ROLLER QUARTZ MILLS,

Concentrators and Ore Crushers,

Mining Machinery of Every Description. Steam Engines and Shingle Machines.

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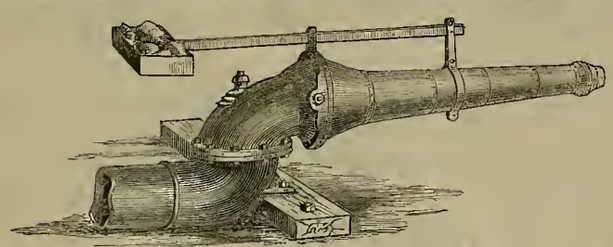

THE ABOVE CUT ILLUSTRATES THE IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture. We guarantee purchasers of this form of Giants against all costs, expenses or damages which may arise from any adverse suits or actions at law. We are further prepared to furnish Single-Jointed Giants when required. Prices, discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent on application.

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AUTOMATIC GOVERNOR MOTORS our Specialty, for Electric and other fine regulation work. Our new MINING WHEEL with GOVERNOR a great success. Send for new Catalogue.

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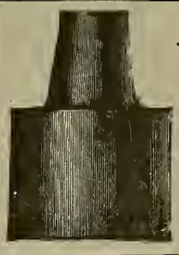

ADAMANTINE SHOES & DIES FOR STAMP MILLS.

These SHOES and DIES are in extensive use in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited, subject to above conditions.

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H. D. MORRIS, Agent,
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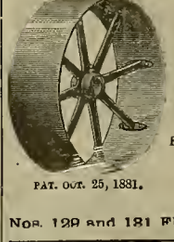
Special attention given to the purchase of Mine and Mill Supplies.



PAT. OCT. 25, 1881.

PERFECT PULLEYS

First Premium Awarded at Mechanics' Fair, 1884.

CLOT & MEESE,

Sole Licensed Manufacturers of the

MEDART PATENT WROUGHT RIM PULLEY

For the States of California, Oregon and Nevada, and the Territories of Idaho, Washington Montana, Wyoming, Utah and Arizona. Lightest, Strongest, Cheapest and Best Balanced Pulley in the World. Also Manufacturers of

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IMPORTERS AND MANUFACTURERS OF

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WALL'S CRUSHING ROLLS,
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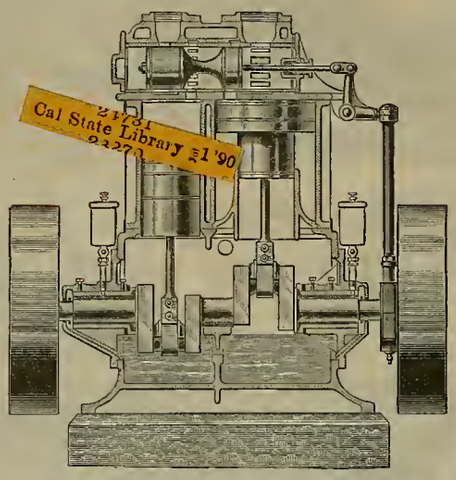
GOLDEN GATE CONCENTRATORS,
GREATEST CAPACITY OF ANY CONCENTRATOR MADE,
One Machine Taking Pulp from 10 Stamps.



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SALES DURING LAST FOUR MONTHS:

COMPOUND, 44 ENGINES, 5215 HORSE POWER. STANDARD, 99 ENGINES, 4500 HORSE POWER. JUNIOR, 166 ENGINES, 4260 HORSE POWER.

Grand Total, 309 Engines, Aggregating 13,975 Horse Power.

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ESTABLISHED 1852. INCORPORATED 1882

MANUFACTURERS OF

Steel Wire Rope,

OF ALL KINDS FOR

CABLE RAILWAYS,
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Mining, Shipping & General Purposes.

WIRE,
BARBED WIRE,
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WIRE CLOTH.

Full Assortment Always in Stock.

OFFICE;
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Send for Illustrated Catalogue.

TRANSPORTATION OF ORE BY HALLIDIE'S PATENT WIRE ROPEWAY.

HALLIDIE'S

PATENT WIRE ROPEWAY,

For the Economical and Rapid Transportation of Ore and other material.

Erected by Us During the Past Fourteen Years in Spans of

200 TO 2,000 FEET.

Simple, Economical and Durable.

HAVE BEEN THOROUGHLY TESTED
In all Parts of the Country.

NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES

For SAVING GOLD!

IN QUARTZ, GRAVEL, OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates Replated, Bought, or Gold Separated. THOUSANDS OF ORDERS FILLED.

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68, 70 & 72 First St., San Francisco, Cal.

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JUSTINIAN CAIRE, Agent,
521 & 523 Market St., San Francisco

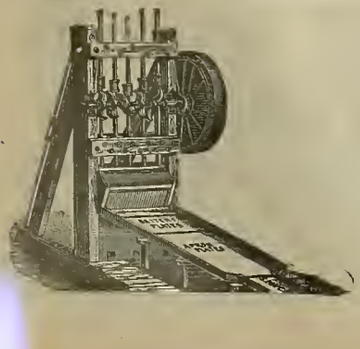
DEALER IN

Assayers' and Mining Material.

MANUFACTURER OF

BATTERY SCREENS AND WIRE CLOTH

Agent for HOSKINS'
HYDRO-CARBON ASSAY FURNACES



IMPORTANT TO GOLD MINERS!

SILVER-PLATED AMALGAM PLATES for SAVING GOLD

IN QUARTZ, GRAVEL AND PLACER MINING.

PRICES GREATLY REDUCED.

Only Refined Silver and Best Copper used. Over 3000 Orders filled. Fifteen Medals Awarded. Old Mining Plates can be Replated. Old Plates Bought, or Gold Separated.

These Plates can also be purchased of JOHN TAYLOR & CO., Corner First and Mission Sts

San Francisco Gold, Silver and Nickel Plating Works, 653 & 655 Mission St., San Francisco, Cal., E. G. Denniston, Prop'r.

Our Plates have been used for 20 years. They have proved the best. We adhere strictly to contract in weight of Silver and Copper. SEND FOR CIRCULAR.

MINING AND SCIENTIFIC PRESS.

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An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 25.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, DECEMBER 20, 1890.

Three Dollars per Annum.
Single Copies, 10 Cts.

The Reports of Our State Mineralogist.

The Most of Them Scarce and All in Great Request.

It was stated in these columns not long since that we would undertake to obtain and forward to parties sending for them copies of our State Mineralogist's reports, we being then under the impression that these books could be procured from that official or elsewhere found without much trouble. This announcement having brought through the mails many applications for these reports, we find now that, with the exception of the last two issued, they are not to be had. This compels us to withdraw our promise, its fulfillment under the circumstances being impracticable. We will, however, keep it good so far as relates to the reports of 1888 and 1889, the most voluminous and important in the series.

The article on chlorination, prepared by Mr. Irelan, State Mineralogist, and which formed part of his report for the last half of the year of 1886, will be reproduced in the next issue of the PRESS. This is done because there is for that article a great demand, the book in which it originally appeared being now out of print and so scarce that it commands a very high price. That the price asked for it does not generally stand in the way of its purchase sufficiently illustrates the utility of these reports and the high estimate set upon them by the mining community. As helps to the entire guild—the metallurgist and the millman as well as the prospector and the practical miner, any one of this series of volumes is worth vastly more than the State has paid for the founding and support of the Mining Bureau, admittedly one of the most beneficent as well as the best conducted of all our public institutions.

MINING IN CHINA.—The Mo-ho gold mines in China now employ over 10,000 men, mostly natives of Shangtung. There are four mines. The Government takes four-tenths of the gold extracted, the remaining six-tenths going to the miner. Sometimes a man will get none out of a whole day's work; at other times several ounces will be obtained. The regulations are very strict, and any theft is severely punished. The machinery employed is not got from abroad, but made in a factory near the mines. It is thought that with European machinery the output would be much larger.

ALUMINUM bronze of ten per cent, it is claimed, has a breaking strength of 310,000 pounds, as against 80,000 pounds for steel; hence, when the time comes, which cannot be far distant, for building bridges of aluminum or its alloy, we shall have a structure about one-third the present weight and much stronger.

LAKE SUPERIOR IRON ORE to the amount of over 8,400,000 tons was mined this year in that region. This is said to be 1,000,000 tons more than the output of 1889. The Escanaba and Marquette mines produced 5,000,000 tons.

THE SURF AS A WEATHER INDICATOR.—The plan of the hydrographic office at Washington to study the action of the surf along the Atlantic Coast and use it as a basis of foretelling the weather at sea is proposed as a tentative attack on the mysteries of ocean meteorology. The work of the Signal Service Bureau in foretelling the weather ashore is dependent on observations from all over a continent of 3000 miles broad and stretching to even a greater distance in length; but on the sea there are no such aids to the observer. The experienced and fully competent men in charge of the hydrographic office would not have sanctioned this scheme unless they had good reasons to think there was something in it, and those who go down to the sea in ships will await the result of the experience with a very lively interest.

THE New York and New Jersey Bridge Commissioners have received a report from Mr. Thomas C. Clarke, the chief engineer. The report was not made public, especially as to location. Generally outlined, the plan proposes to bring all the railroads centering in New York into one great union station within the city. The bridge would have eight tracks, would cost "between $30,000,000 and $40,000,000," and the "bridge is to be centrally located." This is not the North River bridge, upon which Congress has taken action and which has engineers now at work on the surveys.

AN ELECTRIC FORGING MACHINE.—Electricity is about to be introduced into the iron-mills of Carnegie, Phipps & Co., in Pittsburg, Pa., in the manufacture of iron and steel. Two prominent officials of that firm recently received a patent for an electrical device, called an electric-forging machine, which is used for the purpose of "stoving" eyebolts for bridge structures. The machine up to the present time has only been used on an experimental basis, but as these experiments have been very successful, it will be generally introduced in the works very shortly. The inventors claim that by the use of this machine a greater amount of work can be performed, and there will also be a great economy in time and expense, as fuel will only be needed to furnish power for the dynamos.

SALT MINES AT WIELICZKA, AUSTRIA.

THE net earnings of 127 railways for the month of September, according to statistics collected by the *Financial Chronicle*, are $21,782,191, as compared with $20,843,425 for the corresponding month of last year, an increase of 4.5 per cent. Considering the roads by groups, it is found that only two of the groups show reduced net earnings, viz.: the Middle, Western and Northwestern. The Southern, Southwestern and and Pacific groups show increases of 4.35 per cent, 6.71 per cent and 2.9 per cent. This showing, while far inferior to that for the best months of the year, is a marked improvement over preceding months.

Salt.

One of the most indispensable necessities for humankind, and animals as well, is simple salt. It has been used by man as a condiment from the earliest periods of history. It is referred to in the "Odyssey," in which mention is also made of some parts of the interior of India and some remote islands where the article was unknown in the days of Homer. In those days salt was regarded as something sacred—as a gift of the gods. Even the land where it was found was counted as holy. The early nations and tribes of Europe often waged war for the possession of salt springs. In the days of early civilization, and even down to modern times, "bread and salt" went together in common phrase. In the early history of the Jews in the book of Numbers, mention is made of "a covenant of salt."

The first production of salt was from saline waters, and down to the present time that is the source of about one-half of the salt product of the world. It was not until mining was introduced that rock salt became a merchantable product. Mineral, or rock salt, as it is usually termed, occurs in almost every portion of the world. It is confined to no particular strata, as is the case with coal, but it is found in all geological ages and at all depths from the primary rocks to the latest sedimentary deposits. Much rock salt is obtained from deep deposits. In rainless countries it is often found upon and sometimes rising above the earth's surface. When it lies deep in the earth it is mined much like coal.

The accompanying illustration is from the interior of a mine at Wieliczka, in Austria. The underground operations, it will be observed, are precisely similar to those in use in coal mines. Two shafts may be noticed with the men descending and ascending. Galleries are cut out in the mass of salt; mules and tramways are there.

Rock salt is sometimes found sufficiently pure to be placed directly upon the table after being properly reduced by grinding. It is sometimes so much mixed with earthy matter that it has to be dissolved, drawn off and evaporated. New deposits of rock salt are continually being brought to light in various parts of the world, and particularly on this continent.

A HUGE BLAST.—No less than 22,000 pounds of powder were used in a successful blast recently at Port Crescent, on Puget Sound, in the State of Washington, for the purpose of displacing about 65,000 tons of rock, or 320,000 cubic yards of rock in a bluff that juts out at the western side of the harbor at that place. It was fired by electricity, and the result was entirely satisfactory.

THE Detroit Dry-Dock Company is to build at that city the largest dock on the lakes. It will be 400 feet long, 52 feet wide on the bottom, 94 feet wide at the water-line, and with 16 feet of water over the keel-blocks. The dock will be wood, with a caisson steel gate.

CORRESPONDENCE.

We admit, unindorsed, opinions of correspondents.—EDS.

Meadow Lake District.

New Methode for the Treatment of Its Ores.

EDITORS PRESS:—Since the discovery of this district nearly 30 years ago, persistent efforts have been made and methods innnmerable tried for accomplishing the successful reduction of its ores, bnt so far without satisfactory results. So little satisfactory, in fact, have these efforts proved that this district has been practically abandoned for many years, Meadow Lake having become the represantative of dead mining camps and the synonym of failure; hnt there have ever been those who believed in the valne of the ores and cherished a faith in the outcome of the district. That this faith has not been wholly groundless, coming events are likely to prove.

Though a great deal of money has been spent here in the endeavor to work these ores with profit, this has not been all in vain, there being little doubt hut this expenditure has acted as an incentive to still greater and more determined efforts, and that it will ultimately prove to have been the forerunner of success. "Give up" is not set down in the lexicon of the miner, and when one device fails, another is called into action, and so on till at last a seeming impossibility becomes a living fact. Such has been the history of Meadow Lake. At last, however, every assurance is given that the rich sulphuretic ores of this district can be treated successfully, and a plant is now being erected to accomplish this result. No one disputes that all attempts made to handle this ore by the chlorinization process have resulted in failnre, and a cognizance of this fact has led to carefnl experiments for the concentration of the rich hut rebellious atoms; and by thus reducing the great bulk of the ore, it can be handled at a profit. Frne concentrators will collect and precipitate every particle of metal contained in the rock, and these invalnable devices will he employed for that purpose. Even admitting that more than an ordinary percentage of loss does follow this treatment of the ores, it will not figure in the premises to any very great extent. A discrepancy of this nature can be well endured, owing to the remarkably high percentage of sulphurets contained in the rock.

One valuable lesson has been learned by those who have experimented on these ores—one that will contribute more to future successes here than all else combined. It is a well-known fact that there is a large amount of what is known as free gold contained in the rock—an amonnt that would pay handsomely nnder favorable circnmstances, and this is the *Ignis Fatuus* that has lured many mining men who have operated here on to ruin. They would persist in the fruitless endeavor to save this so-called free gold, and gave no thought, or at least hut little attention, to the rich though refractory ore that was being carried away. The trouble is that no ordinary process will save even the bright-looking gold that is caught in such seductive qnantities in the horn or pan. There seems to he a coating of some description on the gold that renders it foreign to the subtle influence of qnicksilver, and it cannot he reached hy it. The man who invests his money here in an endeavor to catch this luring wealth hy any free-milling process will lose it every time. It is something that cannot he done at present, and extremely doubtful if snch a thing will ever be accomplished. The proper, and in reality the only, way to handle these ores successfully is to pay no attention whatever to free milling, use no plates, depend upon nothing hnt concentrators and chlorinize the residue. The Frne machine, as stated before, can accomplish the much-desired end. Samples innnmerable taken from this district have hsen tested all over the world with the most flattering results, and the wonderful percentage of sulphurets contained has in every instance been indeed surprising. In this State, mining properties base in their nature, carrying only a very small amount of free gold, are being operated profitably, yet the percentage of hase metals under a most searching system of concentration only ranges from two to four per cent per ton gross. In comparison we will place the ore taken from the Hercules Mining Company's properties in Nevada county. These ores give a return of from 8 to 22 per cent of gold and silver bearing hase metals, the assay value of the same being about $60 per ton. There is now in this city at the metallurgical works of C. A. Luckhardt & Co., on Stevenson street, a ton of this ore that is open to inspection, and any one so inclined can test it to his satisfaction. It is not selected hy any means, hut is a fair, impartial sample of the character and grade of ore to he found in the Meadow Lake country. The property owned hy this company comprises two locations 600 feet in width by 1500 feet in length each, thereby giving them a strip of territory 3000 feet in length. The ledge is large and well defined, ranging in width from 8 to 50 feet, running about east and west, with a slight trend or dip to the south. The rock is highly mineralized in every portion of the ledge, and for cheap and rapid development it could not be more advantageously located. A never-failing stream of pure, clear, mountain water sufficient in volume to rnn a dozen mills and insnring a pressure of 300 feet, rnns directly over the location, and all machinery placed on the property will he moved hy this power. Timber for mining and hnilding purposes is abundant, and indeed every natural facility for the successful working of the property is immediately at hand. Meadow Lake district is situated in the most picturesqus portion of the Sierra Nevada, and is reached hy a fine mountain highway running from the town of Truckee, on the C. P. R. R. This is the route over which all supplies are transported, the grade being easy and the roadbed firm.

The Hercules Company will commence operations early in the spring, and will prosecute work vigorously nntil the property is fully equipped and in running order. This company will pay no heed whatever to a free treatment of the ore, hut proposes to concentrate exclusively and operate chlorination works. There are many valuable properties in this extensive mineral helt, prominent among the number being the Excelsior, Bodie, Mohawk, Grant, Johanna, Belcher and others, all of which have a promising futnre. The Excelsior has been operated under a bond, and it is stated that a strong syndicate will take hold of it and commence vigorous operations in the spring. In this event, it is proposed that concentration he exclnsively adopted and the most scientific methods employed to rednce the concentrates.

There will nnquestionably he a great amount of work done in this district next season, and if success follows, and it surely will with proper care, the Meadow Lake country will fairly hnm with prosperity. Those owning properties here will not relinquish them, hut are determined to keep np their assessment work, feeling confident that another year will bring about results that will he permanent in their nature and that the old and struggling camp will yet come to the front as a large gold producer.

The topography of the country is such that a railroad can he constructed connecting this mineral belt with the overland road, and though this idea may be ridiculed hy skeptics, it is nevertheless one of the probabilities of the near fnture. R. C. G.

Rich Placer Prospects in Idaho.

EDITORS PRESS:—In these later days of placer mining, 50 cents to the pan in the grass roots and $5 to the pan on bedrock, will to many sound big; yet such is the quality of dirt found in the pay streak of a claim recently opened six miles east of this place, on the north side of Kirtley creek.

The ground was discovered last spring hy the present owners, Messrs. Chompton & Dougherty, two old-time placer miners. While drifting in the side of the main creek, making about $2 per day, noticing a coarse color sticking in the black loam above their gravel streak, they tried a pan of the dirt and got such a flattering prospect that they quit their drift and sunk prospect-holes in the surface; which done they soon traced this gold to its source in the adjacent foothills.

Proceeding to work this newly discovered deposit in a regular way, it has since yielded at the rate of about $1.50 per sack on the bedrock, enabling these men to make large daily wages since. The gold obtained is of good quality, being worth about $19 per ounce. While its well-worn appearance indicates that it had traveled a long way from its original source, the fact of it occurring in the surface soil shows that it did not travel far the last move it made.

Should this deposit prove to be extensive, a considerable immigration to this locality may be looked for in the spring.

Copper Prospects.

About four miles north of this place in the main Rockies, is situated the Shylock group of lode claims, located last July. The ore here, consisting of copper and gold, runs high in both metals, the lode ranging from 20 to 200 feet in width, and cropping boldly for 3150 feet, the whole length of the claim.

The widest stratum which lies next to the hanging-wall, is from 5 to 15 feet wide. It is a brittle, black quartz, containing spots and stringers of black oxide, with occasional kidneys of copper glance and seams of pure cuprite, the latter carrying 74 per cent metallic copper with a little gold and silver.

But little exploratory work has as yet been done on this deposit—an incline shaft put down 15 feet on the hanging-wall, comprising about all that has yet been accomplished. Good facilities exist in the vicinity for opening the mine and reducing the ore, timber being abundant with enough water running in the gulch near hy to furnish a 500-horse power.

In the Birch Creek district are other copper-bearing veins, some of which have been located and partially opened hy residents of Salmon City, and all of which make a fair showing of values. What promise to be valuable deposits of a good lignite with some streaks of a bituminous coal have also been discovered near this place. These deposits are now being thoroughly prospected. Should the result prove satisfactory, it is expected that a branch railroad will ultimately he extended into this region of country. R. B.

Salmon City, Idaho, Dec. 10, '90.

THERE are not enough engineers in the navy to man the new ships.

MONTANA men demand eight hours without a reduction of wages.

The Gold Belt of California.

NUMBER V.

The Ancient Placers and Their Relation to Wall Rocks.

[Written for the MINING AND SCIENTIFIC PRESS by STEPHEN BARTON, Kernville, Cal.]

In order to reach a just conclusion as to the remaining wealth of the ancient river beds and their source of supply of the precious metals, it is necessary to know the conditions under which the deposit was made. Prof. Hanks looks to glacial action. In a previous series I have pointed to evidences of climatic conditions such as do not accompany the movement of glaciers. But when we contemplate the excessive supply of water and the long distance which the gravel in some of these channels had evidently traveled, the question arises, may not glaciers farther to the north have contributed much of the water?

Before deciding such a question, the geologist must master all the other sciences. He must look to astronomy for causes of climatic change; to statics and dynamics for means of estimating the volume of flow; to botany and paleontology for estimating the age and nature of the deposit.

It is quite unnecessary to explain to the student of nature that there was a time when an ice continent capped the pole, covered the highest mountains of New England, sent a glacial drift into Northern New Jersey, and spread a broad terminal moraine over the prairies of Central Iowa. Nor is it necessary to explain that this ice afterward melted away. Let the reader recall, then, that it would take the present Mississippi a number of years to fill a cube of ten miles, and that this ice capping must have represented a depth of ten miles on the shores of Hudson's bay. It is very evident to the geologist that during the melting of that ice a stream as large as the present Mississippi flowed from Lake Michigan through the channel of the present Illinois river, that a similar stream came down the Wabash, and that Lake Ontario outlsted through Lakes Champlain and George into the Hudson at Troy. While this was going on, probably an amount of water equal to the whole drainage of the American continent of to-day was passing through the State of Nevada to the Gulf of California. What is called the Japan current then, probably, struck the coast lower down and gave to this country, under other conditions, a climate similar to what it now has.

Scientific men have not done, however, with inquiring the cause of this changed condition of climate, and before returning to the main subject of inquiry, I will make a few observations in relation thereto. Whoever has been so fortunate as to he able to visit the modern schoolroom, has seen suspended on one of the walls a chart or diagram of the continental and oceanic hemispheres. The one striking fact, at once observed, is that these hemispheres stand diagonal to the poles. Let us now enter the school yard. We find the boy spitting on one side of his top and weighting the wetted side with sand, doubtless for the very purpose of noting the staggering movement this diagonal weighting of polar regions will produce. While spinning very fast, the top staggers hut slightly and very slowly; hut as diurnal rotation diminishes, the staggering increases in extent and rapidity. A change in the amount of diagonal weighting increases or diminishes the precessional movement. Now it is conceded that the whole Mississippi valley was filled to an unknown depth hy sediment brought down from a lofty mountain range which once stood on the shores of Hudson's bay. When this mountain was then in all its pristine grandeur, it intensified the diagonal weighting of the northern pole. The attraction of the sun and moon upon the higher regions of the equator were not sufficient to overcome this vibrating tendency, and the earth's poles were inclined 55 degrees from the perpendicular to the plane of the ecliptic. During a portion of the year the rays of the sun fell quite as directly upon the pole as upon the equator; besides, at the pole, it did not set for six months. This gave to each of the polar regions such a vegetable growth as is hardly met with now under the equator, and was the parent of the vast coal-fields of high latitudes. As this diagonal weighting wore away, by the bending forces everywhere at work, the poles of the earth started to right themselves to a position more nearly at right angles with the plane of the ecliptic, hut a movement once begun did not stop at the point of a true mean, but like the pendulum continued as far the other way, and came to within say 5 degrees of the perpendicular. The equinoctial and the ecliptic now nearly coincided, and the sun moved hut 5 degrees from the equator. Polar regions were enveloped in ice. While ice was shoving great blocks of granite upon the prairies of Iowa, the valley of the Parana was invaded at the south and glacial silt was finding its way even to the valley of the Amazon. Ocean currents were more pronounced than now, and did much to maintain the dominion of the sea. But on the land this diagonal weighting was again taking place, ice being substituted for granite. Like the return of the pendulum, the poles of the earth were only ready to return again in the direction of the point of mean inclination when it felt the additional impulse of this extravagant weight of ice. As the sun rose to a higher elevation in the polar regions, every summer, the ice of ten thousand winters began to disappear, and one half of the contents of the ocean no longer remained locked in a solid form. To assume that these vibrations have not been repeated—repeated as often as the swinging of the pendulum—is to assume that the earth had a beginning, and no scientist is ready to declare, as a known and scientific truth, that it ever did grow any faster than as we see it growing to-day, hy the falling of meteoric matter from the regions of space. There probably have been times in which one of these ice continents outgrew the other, in consequence of these two facts: First, the earth's orbit is elliptical and in its yearly circuit it is three days longer in making 180° on the long than on the shorter side; second, this extra amount of sunshine is given first to one pole and then to the other, every 26,000 years, in consequence of the swinging of the poles, which swinging gives the precessional movement of the points when the equinoctial crosses the plane of the ecliptic. Hence for a period of 12,000 years there are three days more of sunshine per annum upon one pole than on the other, and then the extra sunshine passes the equator in the direction of the other pole. The building of an ice continent on one pole in excess of that on the other would change the center of gravity of the whole earth to the extent of balancing the matter thus transported, and this increase of the solids would draw the fluid ocean after it and raise coast lines in that hemisphere.

Thus we see that the ancient channels may have met the sea in the region of the placer mines. If this was the true condition, then the coast line must have been elevated farther north and the ancient channels must have had a lower grade than that now indicated. This was undoubtedly the case. The great caverns in the line at Columbia which were filled to a depth of 50 feet or more in some instances, were undoubtedly filled hy the sobbing and circling of the cross currents of a mighty stream running over a rough formation at a low grade. Every placer miner knows that when a current plunges into a pot-hole it will leave no gold there; hnt here the gravel had been deposited hy a circling current against all the walls of the "sink," as these deposits were called, the sheet of gravel standing nearly vertical against all the walls.

It remains to he noticed the chemical effect which ice and rain-water have npon formations containing lime, whereby every fissure is eaten into a cavern in addition to the eroding power of a powerful current. Such forces, in many cases, tore down the incasing walls of the lode and subjected the matrix to decomposition. In the older granites, the bottoms of the lodes were reached, and the evidence of their location obliterated. In other cases, the entangled current, struggling with a broken bed, had its transporting power reduced, and deposited gold and gravel near the native matrix. Thus I conclude that the large lumps found near Columbia were born of that region.

I did not start in to write a geology of California, nor did I, like some of our most eminent geologists, aim merely at the harmonizing of theological creeds. I have aimed to present an honest and impartial view of the facts presented to me during years of mining life and the conclusions which I deem justly deducible therefrom. I am aware that the conclusions I have arrived at are at war with those of many eminent writers, hnt must plead in extenuation that none of them claim to he able to explain all the observed facts. If some one of the old mines in Mexico, of which the Padres have handed down a record, should he reopened to great depth and he found to he fabulously rich, as reported, in the bottom, after hundreds of disappointing results in similar searches, I should probably do like other writers on geology—eliminate what I have said about mines and try a new theory. I have aimed to keep in harmony with all known laws, while I have refused to take the dictum of a great name against the evidence of my senses. And now I believe I will close, perhaps forever, my discussion of the geology of the placer mines.

The Pan-American Railroad.

The Intercontinental Railway Commission, composed of representatives of the United States and other American republics, has been called to order in Washington by Secretary Blaine. The Commission is called to promote the survey for a line to connect the railway systems of North America with those of South America. At present the American and Mexican systems extend 183 miles south of the City of Mexico. To carry them to the northern boundary of South America will require about 1700 miles of line through Central America, of which about 300 miles are already constructed and in operation, and about 800 miles are being surveyed and constructed, leaving 600 miles yet to be located.

In the southern part of South America the Argentine, Chilean, Brazilian and Uruguayan railways are in connection and extend northward within 120 miles of the Bolivian frontier and are being rapidly pushed farther. Concessions have been granted for a line to connect them with the Bolivian and Peruvian systems, which will afford connection with Cuzco, Peru. Between that point and the northern boundary of South America little has been done, although lines are now projected from Cartagena to Bogota in Columbia. From Cuzco to railway connection in Costa Rica is about 2200 miles. Here is where the bulk of the work is to be

done and the ronte is yet to be decided. This is one of the problems that will come before the convention. The Pan-American Conference favored uniting the chief cities along the route as far as possible, hnt where that would be inconvenient to connect them with the trunk line by branches. The line on the western flank of the Andes taps the richest agricultural country, hut there is a choice between that and lines along either the Andean plateau or the western slope. The greatest difficulties along the line are believed to be in crossing the mountains in Colombia.

The Sources of Nickel Supply.

Since the discovery of the value of nickel-steel plates, large calculations of profit are indulged in by owners of nickel properties and others interested in smelting works. The future demands for armor plating are put down at large figures, and if accounts are entitled to credence, there is something like a scramble by manufacturers in the United States and Europe to secure themselves from the greed of mine monopolists. The sources of supply, therefore, are inquired into with unwonted interest. Hitherto the demand for nickel has been on a comparatively limited scale. So it happened some years ago, when mines were opened in Noumea and two full cargoes were shipped for consumption, that the market at once became overstocked, prices dropped to a nominal figure, bankruptcy became imminent, and the mines which had been exploited with so much enthusiasm were incontinently closed. The situation at present is radically changed, for in addition to the wide demand for nickel in the arts, chiefly on account of its anti-corrosive qualities, the metal is discovered to possess a peculiar ductility, which admits of its use as an alloy with special advantages. For example, a new French rifle cartridge has been brought out in which nickel forms an essential part; but it was not until the superiority of nickel steel for certain purposes was announced that the nickel-boomers got fairly to work.

The nickel mines in New Caledonia were the richest known up to a recent date, and were the principal dependence. Considerable quantities of nickel have come from mines in Norway, owned and worked by Sir Hussey Vivian, Bart., M. P. The United States Mint derived its supply from mines in Lancaster county, Pa., owned by Joseph Wharton. The discovery of nickel at Sudbury, in Canada, is of recent date, so that the development as yet is very imperfect; but indications point to the existence of the ore in large quantities. These mines are said to be owned jointly by a Cleveland syndicate, the Canadian Copper Co. and Sir Hussey Vivian, the latter represented by Emerson Foote of New York. The matte from Sudbury carries 30 per cent of copper and 15 per cent of nickel, and in this form is sent largely to Swansea, where the pure nickel is extracted.

We are informed that quite an extraordinary discovery of nickel has been made quite recently in Nevada. Among those best informed it is spoken of as "a wonderful development," and this representation is supported by the exhibit in this city of masses of ore. It is claimed that the nickel is found in deposits almost limitless and of such richness that even what is termed the lowest grade yields 8 to 12 per cent of pure metal. Quantities aggregating hundreds of tons are in sight, which give by analysis from 20 to 35.4 per cent of ingot metal.

The consumption of pure nickel in the United States has been estimated at 800,000 pounds per annum, but in this country and elsewhere there will be increased demands, partly as a result of the recent discovery of malleable nickel used as a veneer for iron, which is made a more acceptable material for household utensils. Private London advices received in New York, and said to be wholly authentic, are to the effect that the British Government has recently been unable to place nickel-steel orders because the nickel could not be obtained. This small supply is attributed mainly to reduced receipts from New Caledonia. The present price in New York is 80 cents per pound for delivery during the ensuing year. From the foregoing it would appear that the Sudbury mines form the main reliance, although it is by no means certain if entire dependence can be placed on the latest advices, that Nevada will not in due time be ranked equal, or even of more importance. Developments at these two points will be watched with unusual expectancy, especially if it is true that the New Caledonia mines are less productive than formerly.

THE wonderful extension of the railway system of this country and the great number of large streams, has led up to an enormous amount of bridge-building. Among present projects is the North River bridge, with a span of 3000 feet; Hudson Bridge, below Albany, 1600-feet span; New Orleans bridge, three spans of 866 feet; Philadelphia bridge, over the Delaware river, with a span of 4440 feet; this is a suspension scheme and seems incredible; Louisville and Jeffersonville bridge, over the Ohio river, total length, 8505 feet; Ohio river, at Bruno's island, near Pittsburg, span 523 feet; Needles bridge, Colorado river, span 660 feet; Memphis, Tenn., bridge over the Mississippi at that city, and at least a dozen more. Nearly all these bridges are for railway purposes.

THE English labor world is still in a state of disquiet.

Death Valley.

A Government Expedition to Visit it Shortly.

"Valley of Death."

Long before a white man ever looked upon the dreadful spot, the Indians of California and Nevada knew it by that name.

Imagine a narrow strip of arid plain, shut in between two mighty mountain walls, the peaks stretching up 10,000 feet into the burning sky. So precipitous are these rocky barriers that in a journey of 14 miles you pass from an eminence of two miles above sea level to the plain 175 feet below the ocean tide mark. The surface of this plain is composed of salt and alkali and it is impossible to go over it on horseback, because it is a mere crust through which the animal you ride breaks up to its knees into a thick alkali paste which eats both hair and hide. There are paths by which one may make one's way across if one knows where to find water on the opposite side.

There is something unearthly about the whole appearance of things in the valley, the two ranges of gigantic peaks that hem it in between them looking like the backbones of a couple of monstrous beasts, and a gray haze that never lifts, making everything indistinct to the view. No vegetation is to be seen save a very scanty sagebrush, with leaves that are not green but gray, with here and there a tall cactus, which looks in the night like a dead man standing erect with arms extended. But the supreme horror of the place is the heat, which is unspeakable. There is a breeze which, instead of being cool, is so scorching hot as to blister your face. Into this natural furnace the sun pours its rays with never a cloud interrupting from one year's end to another. When the famous geologist, Professor Gilbert, succeeded in crossing the valley, nearly 20 years ago, barely escaping death from thirst, the thermometer inside his saddle-bag went up to 130 degrees and then burst.

A suggestive feature of the Death valley landscape is the color of the mountain rocks, which are actually sunburnt to an iron brown hue. Chip off a little flake and you find the stone of its natural lighter hue underneath. Streams flow from mountain springs down toward the valley, but never reach it because the heat dries them up on the way. Once in a great while there is a tremendous storm in the Amargosa desert to the eastward, and a river a mile in width flows from the desert around the south end of the Amargosa range and northward through the valley. Does it flow out again at the other end? Not much. It is dried up and lost before it gets that far.

Such is the Valley of Death—itself simply the most horrible spot in that great region of despair. The object of the Government in exploring it is simply to learn what kinds of animale live there. This enterprise is part of a great work which the Department of Agriculture has been for some time carrying on, the purpose of which is to map out the whole United States into what are called "faunal areas." For example, suppose it is determined what are precisely the limits of the area occupied by the jackass rabbit. When that much is known, it must necessarily be true that any plant which thrives in one part of that area will do well in any other part. There is such an intimate relation between animal life and plant life in this world that, having found out the various areas inhabited by different birds and mammals, you have learned just where each form of vegetable growth can be produced to advantage. When the Government has completed this important task, the farmers of the country will have placed before them maps outlining with the closest accuracy the regions within which each kind of vegetable or fruit is susceptible of profitable cultivation. Thus the agriculturist, wherever he may be located, will know with certainty what he ought to plant.

At the beginning, the expedition will be divided into two parties. One of these is now at Owens lake in California, on the point of starting out. It is under the command of Vernon Bayley, and will begin work at the foot of the Inyo range, to the west of which Owens lake is. Bayley will not go far, however, until joined by Professor T. S. Palmer with the other party.

The first thing done will be to locate all the places where water is to be found. Hundreds of people have lost their lives in Death valley through starting off in the morning without knowing where they were going to find water at night. There will be no such foolishness as that indulged in by the expedition. With every precaution, a sufficient amount of suffering will of necessity have to be undergone. Water is the great desideratum in that horrible place, where the air is much drier than that of the Sahara, and the heat so great as to put the body through a sort of evaporating process such as that to which a dried apple is artificially subjected. So rapid is this evaporation of the bodily moisture that three gallons of water a day are absolutely necessary for each individual, instead of the three pints one ordinarily consumes. If one were to sit down in the desert all day long and do nothing but drink water, he would still feel thirsty. Even with a supply of three gallons a day the blood of the traveler across the waste becomes thickened, the features grow thin and peaked, dreadful constipation sets in and fever threatens madness. In crossing the valley one cannot very well carry with him more than enough water for one day's supply. The only way to do is to hurry over and try to reach the other side—only about 15 miles distant—before one succumbs for want of drink. If you know precisely in which of the gorges of the mountains springs are to be found, it is well enough, but if you are not certain on this point, you are likely to become so exhausted after travelling up to the heads of one or two gorges fruitlessly as to find nothing better to do than to lie down and die the most horrible of deaths. You will not need burial, for your body will not decay, but will simply be shriveled up to a mummy and lie there in the Valley of Death to all eternity, imperishable, staring up at the burning sky. Here and there all over the awful plain of salt and alkali are scattered the dried bodies of men and animals, preserved for all ages to come. During the mining fever in that neighborhood, from 1872 to 1878, hundreds of people were lost in trying to get across. You may have heard of an "alkali sink." That is what Death Valley is. As has been said, the plain of the valley is below the level of the sea, and the alkaline river flowing into it at certain seasons from the Amargosa desert deposits its alkali in the crust, through which the foot in stepping breaks into the abominable paste beneath.

It will be the work of the expedition to kill and capture every sort of living creature that can be found in Death Valley and its surrounding region. Every specimen of animal life to be discovered there will be represented by from a dozen to a score of specimens in the collection which will be brought back to Washington. Mammals, birds, reptiles and batrachians will all be grist to the mill of the naturalists. It is expected that many new species will be secured, such as are not at present known to science. The birds will be shot and the mammals will be trapped at night. All of the gentlemen engaged in this exploration are most expert trappers and they will carry with them many dozens of small steel-wire contrivances of a sort that are found most effective in the capture of all kinds of little quadrupeds. It is not anticipated that the valley itself will afford many examples of animal life, save for reptiles and insects, but in the mountains and around about the oase will be different. As for the reptiles, they will be caught with the hand or by throwing something over them. Doubtless a valuable assortment will be secured of lizards of different colors, and of the peculiar rattlesnakes with horns over their eyes which belong in that country. There are no frogs there, it is supposed, but there are some queer desert toads that live in "washes" where there is water for part of each year. When the water dries up, the creatures bore their way down into the mud deeper and deeper, and when it hardens over them like so much brick, they simply stay there buried until the water comes a few months later to release them from their baked prisons. The entomologist of the expedition will devote his attention to gathering the desert beetles, ants, scorpions, centipedes, and the like.

Very particular attention will be paid to the birds, which, as soon as shot, will be carefully measured in the flesh, skinned and stuffed on the spot. After being stuffed, they will be packed in chests of drawers, which are very hard to carry on muleback, until they are dry. Then they will be put into small boxes with cotton wool and sent to Washington whenever a chance offers. Necessarily communication will have to be constantly kept up with civilization, inasmuch as enough provisions cannot be carried along at a load in the wagons to last for the entire season. The town called Keeler, at Owens lake, will be the intermediate point utilized between the expedition and the world. All the mammals captured will be treated just like the birds. The reptiles will be put at once into alcohol. Greatest interest will be felt in discovering what forms of life are able to exist in so mad a country. Such vegetable life as is found there will afford the botanist material for his collection. Incidentally, the mountains will be explored and covered by the operations of the parties.

The first white man who ever visited Death valley was Capt. Bendire, who told your correspondent yesterday that on the occasion referred to, in 1869, he did not attempt to cross the valley, but simply skirted around its edge, as he expressed it, "like a cat on the edge of a plate of hot mush." Captain Bendire, while doing the act of the cat on the plate of hot mush, came across only three dried mummies of men in Death valley.

Investigation will be made by the expedition of the strange fishes that inhabit certain springs at the south end of Death valley. These are deep pools, and in them are found fish unknown elsewhere in the world, which have no eyes. The whole country thereabout is certainly a most extraordinary one. Seventy miles south of the valley is so-called "Devils' Playground"—a dreadful desert, across which a wind like a furnace-blast continually blows, the black lava and hot sand of its great plain radiating back the sun's heat so that the whole landscape is tremulous to the eye. Southeast of Death valley 100 miles, is "Dead mountain," on the side of which thermometers have registered 140 degrees in the shade. On the east side, the precipitous rocks are much broken up and the sun shining on their white points and angles makes the mountain look from a distance as if whole conventions of ghosts were assembled upon it. The Indians believe, on this account, that the mountain is the abode of their dead warriors. Hence the name.—*Examiner.*

Shop Suggestions by a Cotemporary.

The Boston *Journal of Commerce* gives, among many others, the following reliable shop suggestions:

A bending action in shafts is always a sign of weakness, yet if there is to be any bending allowed it is better to have it distributed about than to concentrate it all at one place. Take a shaft, for instance, that is an inch in diameter, and compare it to one that is twice as large, but having a spot turned off in the center sufficient to leave it no larger than the first shaft in its weakest place; in theory there should be no difference between them.

In building inside cranks all the spring will come in the crank-pin unless the arms have been proportioned to take a share; and in overhang cranks it has been known to have put a stop to the crank-pins breaking by easing them off a trifle in the center, where they are to fit in the crank-arm, so that they will get all the grasping strain in each side, where it belongs, and allow them a chance to give, before a fracture occurs in the only place that it would otherwise have a chance to.

Some one has been making sport in relating his experience with an upright shaft of a turbine water-wheel. One of the boxes showed signs of wearing out for the want of rehabbiting. A temporary one was rigged up out of hardwood just for the occasion, when smoke soon began to make its appearance and all hands were kept busy carrying water from the mill-pond to keep the wheel-house from taking fire. Although wooden bearings are poor things, yet we think that we can show one made from the same kind of wood which has taken the place of babbit for nearly ten years.

A shop hand who has every tool that he can get hold of lying about where they were used last, requires about one-third of his time looking for them when wanted for use, and frequently is obliged to fix up something to take the place of a lost tool to help him out on a job. Where one hand in a shop is bothered in this way there must be something the matter with them all, and no shop can run long with such an extravagant pay-roll. Who could they have here for a boss?

It is one of the best points in a foreman to be able to find out what every shop hand is good for and work him in where he will be to the best advantage, and not let a tool-maker do all the polishing, or a natural-born painter fit up tools for a living. The times are getting around now where everything tells in a machine shop.

Steam should not be required to travel faster than 200 feet per second in entering a cylinder. To find the area in square inches of steam port, multiply the area of cylinder in inches by the speed of piston in feet per minute, and divide product by 12,000.

An overseer having a repair hand under his care who was inclined to be a little forgetful once in awhile, especially whenever any of the shop tools were being inquired for, decided at last to supply his friend with a note-book, to jot down everything that was taken out of the room and what they were last used for. Now, instead of hunting for a lathe dog for half a day, the note-book is first examined to see if it is on an old valve stem out in the boiler-room or laid up overhead on a beam somewhere.

There is a lot of work done at a disadvantage on the upper step of a step-ladder that should be performed from the floor where it belongs. Boring holes in the ceiling and screwing in eye-bolts and screw-eyes is dangerous work, especially where one has to reach out as far as he can to one side, from a light over a machine that is in motion. It takes but little fixing up to rig an extension rod to bore all such holes from the floor, and to catch screw-eyes in a clamp that will let go when needed.

Just as we are feeling pleased with electric lights, telephones and electric buttons, we find that a wire is to be led to the engine lathe to assist in turning tapers and irregular outline work that must be turned from a pattern. Two friction-wheels are attached to the cross feed that revolve continually in opposite directions and are thrown into gear by electro-magnets. A pointer reaches from the tool post to the gauge line that is given to work from, the electro-magnets taking great care to keep the lathe tool in a position where the pointer just reaches the gauge line, regardless how irregular it may be.

Another lathe man has a battery of his own make set up behind his lathe, which he claims assists his eyesight wonderfully. When he wishes to see if he has clamped his work on true, he sets a tool in the lathe that has a wire attached, and a bell rings the instant it touches the highest point of revolution. Sometimes a wheel is wanted to be set true with the bore. Then a tool similar to a boring bar is used, only it is made of brass where it comes in contact with the wheel, so as not to mar the surface, and at the same time to give the current a good chance to step across to indicate that a contact is made.

THE TIRED SENSATION of the optic nerve experienced by those using the electric light is said to be due to the fact that the luminous waves are of great intensity, and not to a preponderance of violet chemical rays.

THE World's Fair Committee at Chicago has stopped fighting, and now there is a chance for some work.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Amador.

PLYMOUTH CON.—*Ledger*, Dec. 13: Supt. Jones reports no change in No. 2 main tunnel. The vein in the tunnel running south from crosscut No. 2 is about the same thickness, 10 or 12 inches. The rock is very rich. One can see gold in almost every piece. A telegram sent on the 10th ult. says the vein is two feet thick and looks well. For the week ending Nov. 22 the drift in crosscut advanced 20 feet. The vein has narrowed down again and is now only 10 inches wide. The ore is high grade but not quite as rich as it was. If we do not find better prospects in running south in the next 10 days, I shall advise making an upraise on the vein. We might find it larger above us.

NEW MILL.—The 10-stamp mill which is being erected by V. P. Yelmini in Pioneer district, near Mace's mill, is about completed. A pile of about 300 tons of rock from the Greisback claim is waiting to be crushed at this mill.

SUTTER CREEK.—The mining interests in this section continue to look up. The prospects in the North Star are as flattering as ever, and, if anything, give better promise of permanency. Stockholders are already feeling confident that the assessment money put in the ground has not been spent for naught. Stock has been sold for 50 cents per share in the past few days. The total assessments aggregate 45 cents per share. At the Rose mine a large body of ore has been struck, but only a small portion is of a paying character. The pay rock is in the form of numerous small stringers and the hope is indulged that these will eventually all come together and form a fair-sized body of pay rock. The new mill at the Wildman is running in good shape, and everything about the premises is prosperous.

Calaveras.

MEXICAN.—*Chronicle*, Dec. 13: The Mexican shaft, adjoining the Utica, is again opened up under the superintendency of Thomas Lane. Rock has been found in the mine that went as high as $1200 to the ton.

BENSON.—The mill of the Benson mine on Central Hill is running on good gravel and a new force of men will be put to work.

ANGELS ITEMS.—The Angels mine has closed down and the company intend, so it is reported, to build a 40-stamp mill before starting up in the spring. The Gold Cliff mine is running night and day and the 20-stamp mill is kept humming steadily. A better quality of rock is now being taken out than has ever been seen in the mine before. The sulphuret is prospecting well.

THE TOWN OF COPPEROPOLIS is gradually forging ahead and is destined to be one of the leading towns of the county at no distant day. Work on the ninth level in the copper mine has just commenced, which has given employment to a number of new hands. Several new families have taken up their residence in the town. New houses are being built rapidly. A new livery stable, hotel, and a number of other business houses have been erected lately.

El Dorado.

DEVELOP THE MINES.—Georgetown *Gazette*, Dec. 11: If our people will only wake up and catch on and interest themselves in encouraging mining enterprises, it is within their power to bring about a substantial revival in our mining industry, which will add thousands to the money now in circulation in this community where there are now only hundreds. We have slumbering mines of wealth only awaiting the spirit of encouragement to have them equipped and made producers. Besides these mines of quartz and ancient gravel beds, we have numerous flattering prospects of both quartz and gravel, well worth the judicious expenditure of capital and energy. In quartz alone, observe what a great benefit the operating of the Taylor mine has been to the community! See what an improvement is being felt even from the recent and small beginning of starting up the Van mine! If the mill-test soon to be made proves satisfactory, at least 50 men will be employed on the Van mine next spring. There are other propositions equally inviting in this mining district which ought to be taken hold of by practical California mining operators. The returns from our pocket, seam and placer mines are good so far as they go, but their output barely enables the town to hold its own. What the town wants is more public-spirited citizens who will take an active interest in aiding and encouraging various mining propositions; but the magnetic hand of enterprise in this place is apparently paralyzed. The community at large partakes of the Silurian nature of the average business man.

GRAVEL CLAIM.—A new gravel mine has been discovered and a company organized, under the name of Rocky Gorge Mining Co., west of the Josephine mine at Volcanoville. L. Evans is superintendent and general manager, J. Sheen secretary, and Courtney Fouch acting manager. Supt. Evans departed for San Francisco, Tuesday, to secure material for equipping the mine. The gravel is a dark-colored material, and prospects pay in every pan. They have located 6000 feet along the hill.

ABOUT PLACERVILLE.—The new machinery for the Pacific has nearly all arrived and been put in place, now being in working order. The new air-compressor of 80-horse power was expected this week. When that is in place, the mine will be in complete trim for heavy work, which will be pushed vigorously. A large amount of mining material has during the past week been hauled to the Toll House mine, Smith's Flat, where work is being pushed rapidly.

Inyo.

FROM THE MINES.—*Independent*, Dec. 12: The reports that come in from the various mining camps throughout the county are of a generally encouraging kind. Mr. Brooks, chief of the party which has made a survey for a big canal from Owens river to Salt Wells valley, went to San Francisco last week. It is understood that it will not be anything near so difficult to make as was expected, and it will not cost to exceed one-half of the first estimate.

Modoc.

COAL DISCOVERY.—Adin *Argus*, Dec. 11: John Thomas came over from Cedarville Tuesday last, and reports the discovery of coal in Steamboat canyon, five miles below Cedarville. Messrs. Neasham & Phillips are sinking a shaft, and report the prospect growing better all the time. We hope the ledge will prove to be genuine and the supply abundant. It would be worth thousands of dollars to Modoc county and another incentive to railroad building.

Placer.

MAYFLOWER CLEANUP.—*Republican*, Dec. 9: The Mayflower drift mine of Placer county cleaned up $16,000 last month and $9500 during the first six days of this month.

San Diego.

THE MANUFACTURE OF IRON.—*Union*, Dec. 4: Several months ago we announced that a project was on foot, backed by perfectly responsible parties, to establish blast furnaces either at Coronado or some convenient point on this side of the bay, for the manufacture of pig iron from the ore of the Tepustete mine below Ensenada, Lower California. The enterprise is so gigantic that it has been received with some incredulity. It should be borne in mind that a business of this character necessarily involves vast sums of money and a multitude of details, and that time is essential to perfect all plans before even a beginning can be made. Those who are financially interested in this matter have been diligent and their plans are now fast maturing. Quantities of ore have been taken from the mine and subjected to analysis in various Eastern cities. Eastern experts have pronounced the iron of an extraordinarily fine quality. Iron manufacturers have without exception expressed the keenest appreciation of the superior value of this ore. During the past week a ton of it arrived here, and some of the chunks were placed on exhibition at the California Bank and the cable company's office, specimens being also forwarded to Cleveland and Pittsburg. "You can state," said L. B. Howard and Gen. Webb to a representative of the *Union*, "that our plans are almost matured, and that the blast furnaces which the people have been hoping would be built, will be in operation within six months, positively. This great industry will under no circumstances be allowed to leave San Diego. Within six months we will have a plant with a capacity of 100 tons of pig iron per day. There is positively no doubt about it. As to whether it will be located at Coronado or on this side, we are not yet certain. Soon after the furnace is in operation a rolling-mill and other manufactories will follow. The plant will involve an expenditure of at least $500,000 and many hundreds of men will be employed. There has really never been any doubt about San Diego getting this, but you must bear in mind that it takes lots of time to arrange for so large an undertaking. The ore exists in inexhaustible quantities, very near the coast, and can be mined with great facility."

Shasta.

COAL DEPOSITS.—*Free Press*, Dec. 13: Upward of a month ago a special expert from the coal mines of Pennsylvania arrived at the Palace Hotel and proceeded into the interior of the State in search of coal deposits. He came to the coast in the interest of a syndicate of Pittsburg capitalists. Yesterday news was received here that the expert had made some remarkable discoveries in Shasta county: A few miles from Millville he found a rich deposit of coal equal to the best product of the Pennsylvania mines. Specimens of the coal will be shipped to Pittsburg at once and in all probability capital will be brought here from Pennsylvania to develop the mines.

JUSTICE PREVAILS AT LAST.—*Democrat*, Dec. 10: It appears that Mark Zellerbach has at last won the suit with Allenberg and others that has been in the courts for many years, over the possession of the Altonna quicksilver mine in Trinity county. Zellerbach will as soon as possible next year build two retorts on the mine and go to work producing quicksilver. This is a great and valuable property and resumption of work on it will give a decided impetus to business in Northern Trinity. The result of this suit gives general satisfaction, both because it is considered just and because it will benefit not only the neighborhood where the mine is located, but also the consumers of quicksilver, a metal that is not being produced in anything like the ratio that our gold and silver mines are being developed. As the Altoona carries a very high grade of ore and all the other conditions are favorable, a large and profitable production of quicksilver could be made here with a moderate expenditure. It is a pity this splendid property should have lain idle so long.

Sierra.

TROUBLE WITH THE CABLE.—*Tribune*, Dec. 10: A representative of the New Jersey company which recently put in the wire cable at the Mountain mine to transport ore from the mine up on the mountainside down to the mill near Sierra City, the contract price for which job was $27,000, has arrived at the mine and will endeavor to reconstruct the plant, the failure of which to work, by reason of the parting of the connections in the line, recently put a summary stop to the mine's operations. The distance between the mill and the mine is 6000 feet and there is one tower built midway to relieve the strain on the cable as the buckets loaded with ore are sent down. The gentleman from New Jersey now believes, after viewing the situation, that two more towers, so as to have one every 1500 feet, will be necessary, although on level ground but one is found necessary in a distance of 6000 feet. The change will at once be made. The milling machinery is reported to be working all right and the mine looks well. The miners who were laid off a fortnight ago when the cable refused to work have been put on again.

Siskiyou.

LOCATING ACTIVE.—Yreka *Union*, Dec. 11: Great numbers of notices have been put up and recorded in the various mining districts of this county claiming placer ground, quartz ledges, water-rights, mill-sites, etc.; many of the placer locations consisting of ancient river deposits situated in the high benches along the modern streams.

RICH DRIFT LEAD.—Yreka *Journal*, Dec. 10: The claim of Lee, Lash, Perlin & Co. at Greenhorn creek, about a mile south of Yreka, is paying about $25 a day to the man. The company has uncovered about 40 feet of the pay gravel, which is five feet thick at bedrock, some 80 feet below the surface of the creek bed. The prospects indicate a large extent of this gravel, as the bedrock is pitching toward the hill a long distance off and can be drained very easily with the Westinghouse steam engine and pump now in use. The men at work are drifting along the bedrock as a cheaper method than making an open cut at such great depth, with the advantage of a stratum of tough cement above the gravel to form a safe roof, although it will be timbered to make sure against any danger of caving. Wm. Huntley Hampton of Portland, a chemist and mining engineer, sent to this county by Oregon capitalists, visited this claim last Friday, and says the blue gravel taken out is exactly like the blue gravel found in Siskiyou foothills on Cottonwood creek, and many experts in mining believe it can be traced under the sandstone formations on the east side of Yreka creek as well as on the west side, from Shasta river to the head of Greenborn, as well as other tributaries and gulches draining into Yreka creek. As considerable gold has also been found lately on Willow creek, about midway between Yreka and Siskiyou mountain, great faith is entertained in the opinion that the famous blue lead extends all the way through Shasta valley from Siskiyou mountain in a direct continuation to the mining fields of the Humbug and Salmon mountains on the west side of Yreka basin and Scott Valley.

QUARTZ MINING.—Judge Spencer has secured the Magill quartz ledge in Humbug gulch, west of Yreka, and will open it on a more extensive scale. Boyle & Co. had their big sled hauled over to Humbug creek last week for hauling quartz from the mine to the mill, as the road is now covered with 14 inches of snow for a considerable distance below the ledge. The quartz is taken to McCook's mill at the forks, owing to scarcity and freezing of water supply at Boyle's steam-mill. The sled is used for transportation of the quartz to the edge of the snow-line and thence by wagon to McCook's mill. As soon as we have rain or warm weather, there will be an abundance of water for Boyle to start his mill. Myron Carrick and Archie Nichols have commenced work again for the winter in their rich quartz ledge at Spring gulch on Yreka Flats, northwest of town, from which they pounded out about $1100 last season in a band mortar, saving the average paying quartz to be taken to mill, with more to be taken out this winter. This ledge varies from two inches to a foot in thickness near the surface, but the owners anticipate it will widen out more permanently as they get farther into the mine. We have been shown some of the specimens taken out, several of which comprise more gold than quartz, plainly visible to the naked eye. The Allen Bros. at Quartz Valley have realized about $14,000 from their quartz mine during the past summer, crushing the quartz in the slow-going process of the old-fashioned Spanish arastra. Their ledge averages from 13 to 14 inches in width, and yields from about $40 to $45 per ton.

Trinity.

WELCOME RAIN.—*Journal*, Dec. 6: Last Tuesday morning a rain set in that kept up until Thursday morning, 2.92 inches of rain falling. Snow fell low down on the hills, and all around us the mountains are snow-capped. The miners are enabled to do a little work, but it is not likely that the water will hold out long enough to do much good unless more rain follows.

NEVADA.

Washoe District.

ON THE COMSTOCK. — *Territorial Enterprise*, Dec. 13: The Gold Hill Pumping Association is meeting with many obstacles in the drainage of the Gold Hill mines to the 2000 level. The incline from the Sutro tunnel level to the point of destination, so far as experienced, has to be timbered almost anew the entire distance, and the work, consuming the greatest portion of time, is not really in actual pumping, but in paving the way for the operations of the pump. The interest displayed on the street in Potosi is unflagging. It is not known whether the last strike of ore was made in a crosscut that entirely crosses and goes beyond the influence of the formation followed by the winze workings or whether it is part and parcel of the same. This reporter has not been in the mine since the new development, and, of course, he cannot tell whether the east crosscut 50 feet north of the winze on the 1130 level passed through the hanging clay wall, through porphyry and through a clay footwall into ore, or whether it has been in clay, quartz and porphyry since it started. If there is a clean separation of clay walls, with an intervening space of porphyry carrying no more metal than country rock carries, then the crosscut is in a new find, and its possibilities must be most interesting to this mining community. If the sides of the crosscut reveal the same amount of clay, quartz and porphyry that has been followed from the 930 level to its present workings, it would require a most enthusiastic Micawber to expect anything different. The winze workings and exploitations are in a most interesting formation, and connected therewith there must exist some extensive precipitation of metal, but in the opinion of the *Enterprise* such precipitation took place in chambers connected with the common debouch of the thermal spring that fed the vein, and not in the walls proper of such opening. As will be observed by the reports from the Crown Point group of mines, winter has set in and much work of exploitation has been discontinued during the past week. The reports from the Yellow Jacket group and the Hale & Norcross and Savage, and also from Chollar and Potosi, indicate a fair season's work. The Douglass mill will shut down as soon as a clean-up is made, and probably not start up again until next spring. The Ophir mill and Little Bonanza have shut down and will probably not start up until next March. Wet tailings the cause. The main shaft of the Rock Point mill broke Tuesday night. It was sent to Carson to be repaired and the mill started up yesterday. The usual amount of exploratory work is being done along the Comstock ore belt and generally with satisfactory results.

THE MINERAL WEALTH OF NEVADA.—*Journal*, Dec. 12: The Pacific Salt and Borax Co. has declared a monthly dividend of $1 per share, payable Dec. 10th. More attention should be given to the great deposits of minerals that lie in the basins of the extinct lakes of Nevada than has heretofore been bestowed upon them. All are running after mines of gold and silver and the wealth in the basins of the old dead lakes is passed by. A deposit of salt, soda and borax that pays dividends is better than a gold mine that is constantly demanding the payment of assessments.

Candelaria District.

MINING NOTES.—Walker Lake *Bulletin*, Dec. 11: It is expected that work will be resumed on the Pamlico mine some time next month. Good work is being done at the old Columbus Con. mine near Candelaria. Eastern capitalists have placed a large amount of money in the property, and under the supervision of Mr. Chas. T. Warren, it is believed the mine will soon be a dividend-payer. The property is now called the Mountain Queen. Rich prospects are being found in the Gillis range on the eastern shore of the lake. Messrs. Hanchett & Trueman have organized a company to work the famous State Line gold mine at Gold mountain. Col. Ellis of Carson City has disposed of his interest in the above mine to the new company, who are now developing the property. It is proposed to work a few men this winter, and next spring put on a large force of men and work the mine on an extensive scale. Esmeralda county has more valuable mines lying idle than any other county in the State. Capital is the only thing lacking to develop them.

FROM CANDELARIA.—The Holmes Co. disbursed about $30,000 on the 8th inst.—payday. An assay of some ore from the first intermediate in the Fountain Queen mine is reported to have gone $564 to the ton in silver. The Holmes Co. shipped six bars of bullion (6014 ounces) on the 7th. For the month of November this company shipped nearly 39,000 ounces. The outlook for a handsome output this month is excellent, as the mines are producing good ore and the mill is running like a seven-day clock, grinding up 60 tons of ore per day.

Winnemucca District.

PLACER MINING.—*Silver State*, Dec. 11: J. B. Foltz, who is a man of means and experience in mining enterprises and who during the past few months has possessed himself and others connected with him of 22 placer claims in Indian Creek valley and Spring valley, came to town yesterday and left this morning for Truckee for the purpose of purchasing lumber to construct two miles of flume to conduct the water of Indian creek to Spring valley. Mr. Foltz intends to erect extensive hydraulic works. Operations will be commenced at the lower end of Spring Valley, with the intention of working thoroughly both old and new ground. Indian Creek valley will be carefully prospected in the future, and we apprehend that this gentleman will do much to revive placer mining in our county.

ARIZONA.

GLOBE DISTRICT.—*Silver Belt*, Dec. 5: The people of Globe had reason to celebrate Thanksgiving heartily this year. The season has certainly been one of growing prosperity for our district. Mining is being actively carried on with the most encouraging results. The weather continues fine, permitting the prosecution of all kinds of outdoor work. The supply of wood and coke for the mines and smelters is increasing, and prospecting and mine development proceed rapidly. New capital is seeking investment in our mines, and Globe is now the most prosperous mining camp in Arizona.

MINERAL PARK ITEMS.—Mohave *Miner*, Dec. 6: H. P. Ewing is leaching on the Tuckahoe. Delhantey is getting some good grade galena ore on the Schuykill. Noel & Canyas are taking out some fair-grade ore on the south end of the Tintic. Steve Smith is still getting some good galena ore on his claim under Surrum's Peak. Mearra & Waggoner are doing assessment work on the Illinois. Wm. Heimrod is doing assessment work on the Copper Trust, the first south extension of the Altata, and is getting some good copper-silver ore. Gilliland, Shippey & Sherrick have leased a block of ground on the Empire, the block formerly leased by Darden & Gilliland being nearly worked out. W. Brakeman has a contract from C. E. Sherman to drive in the lower tunnel of the Distaff mine. C. E. will do considerable work on the Distaff this winter. J. P. Finnegan has struck a six-inch streak of 280-oz. silver and three-oz. gold ore in a claim his little boy found 100 feet from the door of his residence. McKinnon and Koster are sinking a new shaft on the Altata. The shaft is on another and longer lead from the one that has produced so much good ore in the past.

BRITISH COLUMBIA.

WEST KOOTENAY.—Nelson *Miner*, Dec. 7: Considerable has been done in West Kootenay during the past summer in the way of prospecting for placer. Prospectors have searched nearly every creek in the southern portion of the district, meeting with enough good luck to make them anxious for the 1st day of June, the end of the lay-over season. Near Nelson, gold in paying quantities has been found in 49, Bird, and Rover creeks, and a find was made on Hall creek that promises to yield something like the finds made on Wild Horse and other creeks in East Kootenay in the early sixties. On the Lardeaux, a river that flows into Kootenay lake from the north, diggings have been found that pay, the finders, now out at Revelstoke, intending to return this winter to make preparations for a summer's work. While the yield of gold from all these creeks will not aggregate a six-figure total, it was large enough to indicate that next year's yield will reach figures that will surprise people on the coast who believe placer mining a lost art. Some 25 Chinese are still at work on 49 and Bird creeks, having laid in supplies for the winter. One of the number reports the diggings very good, some of the men taking out as high as $5 a day.

COLORADO.

THE MOLLIE GIBSON STRIKE.—Aspen *Times*, Dec. 10: An important discovery has been made in the Mollie Gibson. The ore found appears to be part of a chute and it is of very good grade. It has only just been opened and as yet it is impossible to determine how extensive the mineral may be. The discovery is important because of the fact that it has been made south of the incline. The fault problem is still unsolved. The fittings for the diamond drill have all arrived and this machine will soon be running with three shifts. The drill will move 30 feet a day and the facts regarding the formation will be very rapidly developed.

MINES AND MILLS.—Silverton *Standard*, Dec. 6: The Cliff mine, near the Summit, owned by Jim Sheridan, is showing up some very nice mineral and Jim says he has a sure bonanza. He is also working the Summit, another promising claim. Richard Lambert, Alexander Perrino and Baptista Giadietto have taken a lease upon the Mahel mine, and are preparing to work the property this winter. The new stamps for the Victoria mill were shipped from

Black Hawk on the 26th ult. and are expected daily. The timbers are all framed and ready to put up. It will take but a few days to have the stamps dropping after they arrive. The Polar Star is taking out from 200 to 250 sacks of ore per day. The trail is in good condition and the late snow has given packers a chance to run sleighs from Animas Forks to town and catch up with the work. The mules will be kept upon the trail to January 1 anyway and later if possible. This week ore was struck in two more of the stopes which assays $161 and $214 to the ton.

IDAHO.

STRIKE IN PROSPECT.—Bellevue *Herald*, Dec. 7: The prospects are good for another big mine near Broadford. On the 8th of November, in the Modoc Chief, the miners encountered the hanging-wall of the ledge and on cutting through it came to a seam of blue clay or talc 18 inches thick, the material from which assays 70 ounces in silver and 54 per cent lead. Inside of this clay lining a solid body of glistening ore was found, 22 inches thick. The lowest estimate placed upon this ore by experts is $125 in silver and 65 per cent lead. The tunnel was continued through the ledge, which was found to be nine feet wide between hanging and footwalls.

LOWER CALIFORNIA.

GENERAL MINING NEWS. — *Lower Californian*, Dec. 5: Fielding Myers, who is an old hand at mining, shows some very fine specimens from Alamo, from ledges denounced by him. He went north last week, and will visit Julian and perhaps Pine valley before his return. He said: "Alamo is too lively and promising a camp to leave, and it will be a much better camp three years from now." W. H. Smith & Co., merchants, report an increasing trade not only here but at Alamo, where they have a branch store. The camp seems rather to be increasing its activity as winter approaches. The Mexico brought down from San Francisco on her late trip a lot of mining machinery for the Aurora Co., consisting of pump hoist, ore bucket, self-feeder, etc., and also a set of castings for the Princesa Co. Thos. Peterson, a miner, came into town Sunday night from Valladares, 50 miles southeast of Colnett, where he has been prospecting for gold. He says that the mining outlook in the Valladares district and at Socorro is fairly good. Two men from Alamo are working in an old shaft, 45 feet deep, at Valladares, and are doing well although they meet with considerable interference from water. Mr. Mathieson, a partner of Jack Barnes, is working on the old ditch belonging to the company, and is preparing to start up an arastra. Mr. Peterson states that there are five Mexicans working on prospects with good results, and that at Socorro two men are making money by working small leads.

A NEW MILLING COMPANY.—Articles incorporating the Montezuma Milling Co. were filed in San Diego last Saturday. The incorporators are Thomas Fitch of San Francisco, and Jas. H. Hill, George Kennedy, Wm. H. Furmao and W. M. Colburn of San Diego. The purposes of the corporation are the purchase, erection and running of quartz-mills, furnaces and smelters for the reduction of ores containing gold and silver, in San Diego Co., California, and on the island of Cedros in Baja California. The capital stock of the company is $100,000, of which Thomas Fitch subscribes $99,800.

RAIN AT LAST.—It is seldom that the rainy season in Lower California does not set in before December, as it has this year. Usually there are rains in October, but almost always as soon as November. The copious rains of last night have long been waited for by the farmers to prepare their lands for plowing, and now that it has come there will be busy times on the ranches as well as in the mines.

MONTANA.

ABOUT DEER LODGE.—*New Northwest*, Dec. 10: The shaft is now down on the Forest City mine about 40 feet, and they expect to strike two leads before they reach the 125-foot mark. Their neighbor, the New State, has been working on a lead that is turning out a fine quality of mineral, and the prospect is good for its being a lasting supply. There was an order issued Tuesday night shutting down the Montana Consolidated, Green Mountain, Wake Up Jim and High Ore mines at Butte. They are properties of the Chambers syndicate, and the stopping of work struck consternation to the Butte and Anaconda citizens. Marcus Daly, the chief stockholder, has stated that the suspension is only temporary and work will be resumed Dec. 12. The Gold Creek mines, Deer Lodge county, are making a good showing. The quality of rock found in these mines is very fine. It ranges in value from $70 to $736 per ton in gold. The best feature of these mines is their size—from three to eight feet. They are developed by shafts varying in depth from 50 to 80 feet. Chinamen have taken possession of the placer workings along Silver Bow creek, near Butte, which were abandoned by white men after they had gone over the grounds, during 1864 and a few years later. The celestials, however, expect to glean profitable returns from their overhauling of the placers. Dr. Hoyer has several specimens from the American-Ruby mine, which he expects to have assayed. The rock is simply prospect, but appears to have a considerable amount of mineral in it. A carload of quartz shipped from the Monarch mine, at Elliston, returned about $79 per ton, which gave its owners the net profit of $38 per ton.

MEN WANTED. — Helena *Journal*, Dec. 1: Nearly all the mining camps in Montana will be in active operation during the winter, and the majority of prospectors will seek employment in these, but they will come far from filling the quota of what is needed. Mining men state that considering the activity of the various camps there is a remarkable scarcity of men, and there is hardly a camp in which more men are not needed. Several companies in various localities have laid out extensive work for the winter, but declare they cannot carry out what they have undertaken unless they can secure more men than they have thus far been able to employ. Said an experienced mining man: "If you know of any man who wants to earn $3.50 a day, just send him out to some mining camp. We are experiencing the greatest possible difficulty in securing as many men as we want." All this augurs the most encouraging results and is but another indication that more extensive operations will be carried on in Montana the coming season than ever before.

NEW MEXICO.

MINING NEWS.—Rio Grande *Republican*, Dec. 11: Favorable reports continue to come in from Cook's Peak district. It is to-day the heaviest producer in Grant county. It is estimated that the Surprise now has fully 3000 tons of ore in sight, and Teal & Poe's Grand Central group has equally as favorable a showing. On Tuesday last Wm. Brockman brought in from the Tres Hermanas a carload of ore corresponding in character with that which he shipped some time since and which yielded by actual smelter returns 49 per cent lead and 90 ounces in silver. Geo. Wesley, also of the Tres Hermanas, has out a carload of the same grade of ore. A new strike of ore running over three ounces in gold and seven ounces in silver was made just below the junction of the Kleptomania and the Aztec veins, on the Aztec M. Co.'s property in the Pinos Altos district, one day last week. The ore body is quite large.

OREGON.

MINING ITEMS. — Jacksonville *Times*, Dec. 12: Dr. J. M. Taylor, late of Asbland, who has been dealing in mines for some time past, has bonded the Dysert gravel mine in Josephine county for $15,000. John Huffer, assisted by John Jenson, succeeded in opening a way through the caved-in debris into the long-abandoned Holman tunnel No. 1, up Jackson creek, this week. In the mud on the inside of the tunnel were plainly visible the footprints of the last man who visited it some years ago, he having gained access to it through a side drift connecting with the second Holman tunnel. The black sulphurets, which have been attracting so much attention recently, are not as plentiful as anticipated in either tunnel; but a thorough investigation will be made with a view to further development of the ledges. In the main tunnel opened this week, after passing the debris, the timbers are as sound as the day they were put in. Messrs. Miller, Martin & Beswick of Ashland have been making a careful investigation of their mine near Merlin with the intention of putting in reduction machinery.

SOUTH DAKOTA.

MINE AND MILL.—Deadwood *Pioneer*, Dec. 9: The supt. of the Caledonia mine reports stopes nearly filled in, but it will still take some time for the caved matter to settle. In looking over the mine I have come to the conclusion that it is very advisable to discuss or consider the sinking of a new shaft on the mine. All the ore now developed in the mine is a very long distance from the present shaft—some 2000 feet. To develop a new level and get at the profitable ore in the mine would require the present shaft to be sunk 150 feet deeper and a drift of about 800 feet from that level to encounter the ore body. The present shaft is too small for the work required in the mine. The timbers are all rotten and it will have to be retimbered from top to bottom. The hoisting works operating the shaft are underground, are entirely too light for present purposes and have not the power to hoist from any greater depth than the present lowest level. They frequently break now. Larger hoisting works could not be placed at the shaft as at present situated. A new shaft will open up ways to run ore on all the levels of the mine, and though an expense to sink, will economize operations in the future and be of great benefit, in fact, it will have to be done sooner or later. It will most probably compel closing the works till it (the new shaft) is in condition to operate.

WASHINGTON.

RETURNS FROM IVANHOE ORE. — Okanogan *Outlook*, Dec. 5: Three weeks ago the *Outlook* made mention of the shipment of several tons of ore from the Ivanhoe mine on Palmer mountain. The ore was treated at the Ryan smelter, and the Tacoma *Ledger* of Nov. 27th contains the following statement of the results: Manager Rust of the Tacoma smelter yesterday figured up the results on 16,521 pounds of ore from the Ivanhoe silver mine in Okanogan county. Manager Rust had the ore smelted, and the 8¼ tons averaged 275½ ounces of silver to the ton and nearly one ounce of gold. The net value of the ore smelted, figuring the silver at $1.04 per ounce and the gold at $20 per ounce, was $2250. The Ivanhoe belongs to Cowherd & Westreo, and is located in the Wanicut lake district in Okanogan county. Mr. Cowberd, who brought the ore to the city, says that he and his partner have 500 tons of ore on the dump ready to be shipped as soon as there are transportation facilities. The people of that country are praying for railroad connections, so they can ship their ore here to be smelted.

A PROMISING GROUP.—The *Outlook* mining reporter paid a visit to a group of prospects this week which, although they have heretofore attracted but little, if any, attention, owing to recent developments, are entitled to more than a passing notice. The group includes the Blue Daisy, Eureka, Washington and Silver Bell, all of which are located on extensions of leads from the famous Lone Star mine. The Eureka, which is the south extension of the main lead of the Lone Star, is a fraction lying between the Golden Crown on the east and the Blue Daisy on the west. The Blue Daisy is a full claim and joins 200 feet on the west half of the south end of the Lone Star. It is bounded on the east by the Eureka. Frank Hinds and Geo. Cooper finished assessment work on the Brunswick claim, on Mineral bill, Tuesday, and are now at work on the Last Chance. They struck some fine-looking ore in the Brunswick last week.

WYOMING.

SILVER STRIKE.—*Tribune*, Dec. 13: Wyoming's first rich silver strike is reported from the mine of State Senator Chatterton near Saratoga. The manager sends word that at 350 feet in the tunnel they uncovered a six-foot vein of silver ore and that the assays gave not less than $600 to the ton. This mine is across the Platte river from Brush creek, where gold finds have been made, and the report apparently bears out the theory that the mountains of Southern Carbon county are rich in mineral, as the range continues into Colorado.

Mining Share Market.

Mining shares the past week were fairly active at declining prices, with the exception of Confidence and Savage. The strength in these two stocks is due to the work going on in the mines. The pool succeeded the past week in not only uncovering large lines of stocks but also secured considerable cash stock—stock thrown out by holders frightened into selling, owing to assessments levied and the fear of more to follow. The Comstock shares are better concentrated than at any time within the past 12 years, and it is not at all reasonable to suppose that those who have brought intend to unload at a loss. The panic in New York and close money market in this city worked in the pool's favor by causing heavy selling—forced and otherwise—by outside holders. The situation at the mines does not warrant the decline, but on the other hand it justifies much better prices. Take for example the Gold Hill mines, drifts have been and are being run for better ventilation and also to admit of several important levels being opened up to better advantage, not only for prospect work, but also for extracting the rich ore found in two or more of the mines. The pumping out of the Gold Hill mines admits of developing below the late water line the rich ore in Crown Point, Yellow Jacket, Seg. Belcher and Overman. The ore should work up to over $30 a ton in bullion, even after allowing a large percentage for mysterious disappearance. In the Middle mines, several levels are about ready for active prospect or developing work, and it is said with every encouragement of the best results. In the 1886 deal, when prices for stocks were advanced within a few months from cents up to as many dollars, the work being done in the mines was almost nothing. Since then active deadwork has been done in all, and very little now remains, except prospecting and developing work. Since 1886 there are better milling facilities and lower charges; besides which silver is higher and no a more substantial footing, with still higher prices not at all unlikely. The Sutro Tunnel litigation has been or will be settled soon. It is conceded by the ablest financiers that the money markets here and at the East will, after Jan. 1st, work into more general ease than for several years past. Cheap money inspires speculation.

In outside mining shares, trading has been quite active in the Tuscaroras under concentrating buying. The Quijotoas have ruled weak. In the Bodies, trading has been light at declining prices. Another bullion remittance has been received from Bodie. Reliable and trustworthy parties, who are in position to know, affirm that there is very little, if any, Bodie stock out, and that the work going on in the mines is of such a character as to warrant the assertion that a very pronounced upward move in the stocks is likely to set in very soon.

The milling and transportation charges on Crown Point are $5 a ton. This is another reduction.

Annual reports of the superintendent of the North End mines are of the most encouraging character, inspiring the belief that 1891 will witness more developing work than for many years past, or since the Sierra Nevada deal.

In 1884, 1885 and 1886 Hale & Norcross was the pivoty stock, but just before the deal of 1886 the price went quite low. This year Potosi is the pivoty stock. Well-informed miners and knowing stock operators have very little faith in it, but think that when the deal commences it will be in some other stock.

News from the Comstock mines has a better tone. It now looks as if the mine managements are getting ready to confirm within the next few months what the MINING AND SCIENTIFIC PRESS has heretofore made public regarding rich ore in some of the mines, particularly in the Gold Hill group. The work on the 300-foot level in Challenge and Confidence is calculated to run into rich ore. Official letters received yesterday from Hale and Norcross, Savage, Challenge, Confidence, Crown Point, Belcher and Seg. Belcher have a more encouraging tone than for several weeks past. They even go so far as to hold out the hope of finding considerable rich ore before the summer months. In Savage, on the 1300-foot level, they are sinking on $40 to $60 ore. Con. Virginia's battery assays are steadily increasing. From the outside mines there is nothing new to report. More prospecting work is reported in the Bodies, while favorable news comes from the Tuscaroras.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

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MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 18, 1890.

General trade the past week has been quiet. Money continues to be reported close, but the future holds out hopes of an easier market than for several years past. The disbursements in January will be unusually large.

MEXICAN DOLLARS—The market is quiet at 82@83c.

SILVER—Offerings, purchases and prices paid so far this month are as follows:

Date	Offered ounces	Purchased ounces.	Price paid per ounce.
December 1 ...	891,000	566,000	$1.0075 to $1.0750
December 3....	1,301,000	321,000	1 0545 to 1.0595
December 5....	1.080,000	255 000	1 0460 to 1 0500
December 8.....	...	685,000	1.0280 to 1 0350
December 10...	789,500	395,000	1 0300 to 1 0447
December 12...	1,166,000	760,000	1.0440 to 1 0500
December 15...	918,000	689 000	1 0500 to 1.0900
December 17...	657,000	210,000	1 0750 to 1.0815
Total.....		...3,881,000	

The above, together with the counter purchases, make 4,500,000 ounces. No further purchases will be made until Jan. 2, 1891.

The silver market, while in an unsettled condition, has elements of strength which causes many holders to look for better prices later on. The demand of the country for monetary relief has had its effect on Congress, and it now looks as if more favorable silver legislation will result. While it is hardly likely that a free-coinage bill will be passed, yet it is probable that the Treasury will be given authority to purchase the surplus silver in this country. This will afford relief to the silver market and naturally bring about better prices. Bimetallists, while disposed to accept this, are still in hope of securing better legislation by having a provision inserted giving free coinage after a certain length of time. English mail advices are more favorable to silver, with the current of opinion setting in favor of the Exchequer using more of that metal. Close money markets the world over are working favorably for silver.

London cables received to-day (Thursday) quote silver at 49⅛d.

QUICKSILVER—Receipts the past week aggregate 534 flasks, and exports by sea 140 flasks to Mexico. The market holds to steady prices, under a fair demand.

BORAX—Receipts the past week aggregate 210 ctls, and exports by sea 32,950 lbs to Chicago. The market is steady at current quotations. At the East the demand is reported slower. Shipments overland the last month aggregate 8544 ctls.

LIME—Receipts the past week aggregate 4042 bbls, and exports by sea 1150 bbls to Honolulu. The demand and prices are as heretofore reported.

COPPER—The market is virtually unchanged. Close money markets the world over and annual settlements at hand are against holders. The latter express confidence in the future, with better prices looked for in the spring months. The statistical position of the metal favors holders. In last month there was shipped overland 472 ctls of copper cement.

TIN—The market for pig is weak at lower prices. Plate for both spot and to arrive is firm at full prices.

LEAD—The market for pig is lower and other kinds have an easier tone. At the East the spot market is in buyers' favor, but for distant delivery higher prices obtain. It is claimed that before spring, supplies will be under control.

IRON—English advices report a feverish and generally weaker tone to the market. At the East the inquiry is said to show an improvement which is encouraging in view of the close money markets. Our market is reported quiet, with an easy tone for both spot and to arrive.

COKE—Imports the past week aggregate 252 tons from London. The market is reported firm.

COAL—Imports the past week agregate as follows: Seattle 882 tons, Tacoma 4000, Nanaimo 1300, Departure Bay 3956, Coos Bay 700; total, 10,438 tons. The market is barely steady for coast coals. Buyers do not appear disposed to anticipate their requirements to any extent, believing that toward the last of next month lower prices will obtain. Coast collieries are making hay while the sun shines. The Tacoma *Ledger* reports a big strike in one of the mines, and also says that last winter the collieries had difficulty in meeting the home wants, but this winter they have an oversupply. The Empire mine at Mt. Diablo has made a big strike of good coal. Other mines are being opened up.

Coal and Coke.

SPOT FROM YARD—PER TON.		TO LOAD—PER TON.	
Weltington	$12 00	Australian	$ 7 75@— —
Greta	14 00	Liverpool St'm.	8 50@— —
Carbon Hill	9 00	Scotch Splint..	8 50@ 9 00
Nanaimo	11 00	Cardiff	8 50@— —
Gilman	10 00	Lehigh Lump..	16 50@17 00
Seattle	10 00	Cumberland bk	13 50@— —
Coos Bay	9 00	Egg, hard	15 00@— —
Cannel	16 00		
Egg, hard	16 00	**Coke—English.**	
Cumberland, in sacks	19 50		
do. bulk	18 00	To load	$12 00@13 00
Wallsend	13 00@14 00	Spot, in bulk..	16 00@18 00

Eastern Metal Markets.

By Telegraph.

NEW YORK, December 17.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	48	1 04	$15 25	$4 12½	$21 20
Friday	48½	1 05	15 25	4 12½	21 00
Saturday	48½	1 04	15 25	4 12½	21 00
Monday	49	1 08	16 25	4 15	21 15
Tuesday	49½	1 08	15 00	4 10	21 15
Wednesday	49½	1 07	15 00	4 10	20 80

Tin is easing off. Lead is barely steady; heavy stocks of imported are against holders. Copper is slow and quotations nominal. There is a move on foot to contract the leading Lake mines' output; price named is in the vicinity of 16 cents.

MECHANICAL PROGRESS

Machines—Human and Mechanical.

New Inventions Greatly Enlarge the Scope of Labor.

Much has been said of late in regard to the influence of labor-saving machinery on the scope of labor, and it has been stoutly held by many that the present condition and future prospects of mechanics in this country are far less satisfactory than they were in the earlier history of the country, before the recent great advance in the introduction of labor-saving machinery. But the most careful-thinking people, even among our best mechanics, hold to the contrary. In consideration of this question, we would refer our readers to the following, which we clip from the columns of the Holyoke (Mass.) *Manufacturer:*

As old people fondly look back on the days of their youth, and say that such days were fraught with more of sensible and pleasurable living than is experienced by the rising generation, so do many of our veteran mechanics delude themselves by thinking that when they learned their trade, under conditions far more narrow and crude than those belonging to the advancement and greater enlightenment of the present day, men who followed mechanical vocations were better off and had more promising opportunities than they now do.

No doubt there is a good deal to make such reasoning appear plausible. Thirty or 40 years ago small machine shops were scattered thickly throughout the country, and many a mechanic, on a contracted scale, conducted an independent business for himself. Every settlement in the country had one or more clever individuals who, with the few rude tools and appliances of the times, did the "tinkering" for their neighbors. There was a deal of mechanical work done by hand, and to the old stagers it seems as if men then obtained employment more generally than in these days, in which labor-saving machinery has such extensive usage. But if they stopped to think, they would perceive that as many, if not more, individuals in proportion to the number of inhabitants, are at the present time engaged in mechanical pursuits. There has been a concentration of labor, that is all. The small shops have disappeared, but large establishments, containing new and improved machinery of all kinds, requiring for its guidance many hands, have supplanted them, and surpassed them to an immense extent in amount of work performed. It may be said, to roughly illustrate, that men now work in gangs, and under a system of concentration, whereas formerly labor was more generally diffused among individuals who worked independently of each other.

What the Grumblers Say.

The grumblers say that the mechanic is not so much in demand, and not so much respected, socially, as he once was. At the time when steamboats, railroads, and labor-saving machines were beginning to be constructed, no doubt wages were good, and the services of the mechanic held in high value. Circumstances then were such that for a time an unusually lively impetus was given to that department of labor peculiar to his vocation. The field was wide and sparsely tilled, and with no great degree of effort yielded rich returns. But after all, the methods of the time, if enterprising and vigorous, were yet rude, and of a nature necessarily so transitory that they soon yielded before more disciplined efforts and more careful, exacting and intelligent requirements. So the hasty methods of the mechanics of former days, and the few rude appliances and tools they used, did good work in their time, but would not be suitable now.

With the Growth of the Country

Machinery has increased, and the mechanic has commensurably gained in intelligence. The result is natural enough, and desirable. Now we make more devices in a day than would have sufficed for a month 30 or 40 years ago, and modifications and improvements, one after another, crowd upon each other with astonishing rapidity. The mechanics of to-day are obliged to make themselves acquainted with the manner of operating multiform contrivances, and in such connection must continually make practical application of many of the principles of natural philosophy, the laws regulating steam, etc. Who doubts that many more well-educated and intelligent men are found among the ranks of craftsmen than formerly? If anything, the community awards the best and most worthy members of this class a higher social position than that possessed by their predecessors of a generation or more ago.

Beneficial Effect of New Inventions.

Many new inventions of utility greatly enlarge the scope of labor rather than contract it. By use of labor-saving machinery many more useful fabrics and articles are manufactured, and also many new things are made which soon create new wants among the people, whose consumption of any given manufacture, when times are good, keeps pace with the increased production. Since sewing machines were invented, the average housewife probably has two new calico gowns where formerly she had one. *Labor-saving machines do not decrease the amount of work performed by people in the world; they only bring about greater results in proportion to the strength laid out in their management than manual exertion without their aid can accomplish.* The law of things is such that men may vary, facilitate and advance their undertakings to vastly wider performance, but still the generality of them, albeit under easier and more favorable conditions, must work as much as did primitive Adam in the rough country outside of Eden.

During the past few years, mechanics, in common with all other classes, have suffered much from the evils of widespread business depression. Thickly multiplying inventions have doubtless tended to create a temporary disadvantage, for inventors did not cease to construct many fresh devices, as well as make numerous improvements in old machines, up to the stagnate period of business, when the demand for all kinds of manufactures was on a scale of contraction. Nevertheless as soon as makers and inventors find that they are overcrowding the market to such an extent as to be losing or wasting considerable money in so doing, they stop manufacturing until the surplus is disposed of and the demand and supply are equalized.

But until this happy result is realized the mechanic suffers severely from lack of sufficient employment, because purchasers of machinery cannot afford to buy new tools, or improve old ones, since the demand for the goods made by these machines has likewise dropped off. Let the business of the country be once fairly revived, however, and machines, old and new, will be in active demand, and the mechanic will have no reason to complain of their influence.

There Is a Bright Future

For the skilled laborer in this country, provided only he will steadily follow the path of progress, embrace all his opportunities for improvement and advancement, and obtain a thorough mastery, practical and theoretical, of his trade. He cannot be successful if he unambitiously plods like a day-laborer and does not consider his vocation an art in which to take pride and make continual improvement. He must not stop to complain, but must endeavor to keep pace with the enlightenment of the times, must educate himself by all means in his power, and obtain superior intelligence. Indeed, it would seem advisable for mechanics in each manufacturing community to club together and establish schools in which, were they not more than an hour or two during two evenings of the week, they might acquire some geometry, the elements of mechanics, the theory of steam, magnetism, electricity, etc.

The workmen who may thus strive to obtain education and make effort to completely master all details pertaining in any way to their calling, will soon find intelligent exertions rewarded by the attainment of a good living, and an honorable position in society as well.

MAKING FISH-HOOKS.—There is a little machine which turns out fish-hooks in six strokes. Stroke number one bites off a morsel of steel wire; number two makes the loop where you fasten your line; number three hacks the other end; number four flattens and bends back the barb; number five makes the point; number six bends the wire; and your fish-hook drops into a little bucket, ready to be finished. Then it is either japanned—these are the common black fish-hooks—or they are tempered to the delicate blue that you sometimes see in cutlery. For this finish they are heated red-hot and then cooled in oil.

ROLLING TUBES FROM FLUID METAL.—We recently made a somewhat full notice of rolling rails direct from molten metal. The same principle is now about to be applied to rolling tubes and other shapes by the same general system. It is claimed for this process that by it pipes may be made by continuous action of any desired length and without seams or welds of any description. Pipes may thus be made much cheaper than by any other method and of much superior quality, as the metal must be homogeneous throughout.

ENGLISH OPINION OF AMERICAN GUNS.—Col. W. Hope of the British army, who has been investigating American naval ordnance, has returned to England. Just before leaving he said that he should advise his Government to raise the standard of its gun-making. He declared that it would be inviting national disaster to pit the present British navy gun against the ordnance now being introduced into the American navy. He closed by remarking: "The American navy guns are absolutely perfect of their kind."

IN PHOTOGRAPHING PROJECTILES in motion, no results of any importance are obtained till the velocity of the shot exceeds that of sound. But at higher speeds a wave of compression is found preceding the bullet in its flight. The shape of this wave is hyperboloid in revolution, with the apex some distance in front of the shot. Behind the projectile there is a conical wave formed, the angle of which is less, the greater the velocity.

PUTTING IN WINDOW GLASS WITHOUT PUTTY. David Crosser of Cardonia, Ind., has secured a patent on his invention of a self-locking window-sash, by which the panes of glass are easily and instantly adjusted in the sash from the inside, dispensing with the use of putty and other usual appliances for holding the glass in position.

SCIENTIFIC PROGRESS.

Glaciers—Their Formation and their March.

In high valleys, among the mountains whose tops are covered with perpetual snow, are often found seas of ice called "glaciers." They are formed thus: Snow that falls upon lofty mountains melts very little even in summer. So in valleys high up among the mountains it gathers to a great depth, and from the weight of snow lying above, the lower layers become icy, as a snowball does when squeezed. The upper crust melts a little during the heat of the day, and the water sinks down through the snow and then freezes at night. From this melting and freezing, the mass of snow is soon changed into a sea of ice.

In traveling down valleys, those ancient glaciers leave traces of their journey. Over all the places where the ice seas have passed, the rocks are rounded and highly polished. A field of these rounded rocks, when seen from a distance, looks like a field filled with sheep crouching on the ground, and Swiss geologists have called them *roches moutonnees*—"sheep-like rocks." In a valley along the summit of the Rocky mountains, near the "Mountain of the Holy Cross," there is a beautiful display of these polished, rounded rocks.

As the glaciers move down the valleys, great rocks, frozen fast in the ice on the sides and at the bottom, scratch and mark other rocks as they pass by and over them. Sometimes these scorings are very broad and deep, for the immense rocks the glaciers carry are like strong, powerful tools in the grasp of a mighty engine.

Sometimes the lines are as fine as those of a steel engraving. They usually run all one way, and by looking at the direction in which the lines run, one can tell the direction in which the glacier moved. In the sandstone west of New Haven, Conn., and in the granite of Middleboro, Mass., the deep, broad scorings can be plainly seen, running toward the southeast. The hight at which these scratches occur tells us something of the depth of the ice. Markings in the White mountains indicate that the ice was more than a mile deep over the region now known as Northern New England.

Wherever the glaciers melted, they left an immense amount of "drift," that is, sand, gravel and stones of all sorts, which had been frozen in the ice when the glaciers were forming. The stones of this drift are of all sizes. Some are as small as pebbles; others as large as small houses. There is one at Bradford, Mass., which measures 30 feet each way and weighs 4,500,000 pounds. There is another on a ledge in Vermont which is even larger than that, and which must have been carried by the ice across a valley lying 500 feet below where the stone now is, showing that the ice was 500 feet thick. Great bowlders of trap rock extend through Connecticut on a line running to Long Island Sound; and as some of the same kind are found in Long Island, the glacier is believed to have crossed the Sound, carrying these rocks with it. An immense statue of Peter the Great, in St. Petersburg, stands on one of these glacier bowlders of solid granite, which weighs 150 tons. One of the largest bowlders in America is in the Indian village of Mohegan, near Montville, Conn. The Indians call the rock "Shehegan." Its top, which is flat and as large as the floor of a good-sized room, is reached by a ladder.

Sometimes these bowlders are found perched upon bare ledges of rock, so nicely balanced that, though of great weight, they may be rocked by the hand. They are called "rocking-stones." Near the little Connecticut village of Noank, on Long Island Sound, there is an immense bowlder called by the people there "Jemimy's Pulpit." It was formerly a rocking stone, but the rock has worn away below it and it can no longer be moved.—*Teresa C. Crafton in St. Nicholas.*

Ozone and Epidemics.

Ever since the discovery of ozone, fifty years ago, by Schoenbein, and the advanced knowledge of its great oxidizing properties, chemists have struggled to solve the problem of producing ozone in large quantities. These efforts date back as far as 1857, when Werner von Siemens, the head of the now world-famed electrical firm of Siemens, of Berlin and London, constructed the first ozone tube, which has since become the basis of all similar devices where ozone is generated by electricity. As in nature, when the lightning during a thunderstorm converts the air into O_3, ozone can be produced artificially by electrical discharge on the same principle.

As the air after a thunder-storm has been found to be free from micro-organisms, this fact being due to the large amount of ozone created by the violent electrical discharges, a theory has been established by Frericha, Falh and many others that the possibility of the spread of epidemics may be due to the absence of ozone in the atmosphere. Especially after the cholera epidemic of 1871, the absence of ozone was generally observed throughout Europe, and Prof. Frerichs, in one of his lectures, said at the time that "epidemics are in some degree due to the absence of ozone in the air, or that whatever amount of ozone had been in the air had been consumed in destroying microbes. If it be only possible," continues the professor, "to produce ozone in large quantities and cheaply, every one during epidemics should drink ozone water."

With the progress of electrical science, this problem has been solved. In New York a firm has established a large plant at 86 Walker street, under the name of the Ozone Manufacturing Company, whose object is to introduce this late discovery of Siemens, both into therapeutics and the arts. A large electrical plant, producing a tension up to 14,000 volts, imitating in its process the lightning striking through the atmosphere, converts air or oxygen, passing through tubes, into ozone, and it is claimed with such results that unlimited quantities of ozone can now be cheaply produced. Ozone is used in various industries for bleaching, refining, deodorizing and disinfecting.

In medicine, strong oxidizers, such as peroxide of hydrogen, have of late been prescribed; but the specially beneficial effects of ozone seem to make it doubly valuable in prescriptions, since it is possible to have it in staple form in aqueous and oil solutions. As an antipyretic it seems to be of great promise. for Prof. Liebreich and Dr. Gottstein, of the University of Berlin, have recently discovered that ozone destroys the bacteria of cholera and typhoid fever in water. It has also been stated, by Dr. Arthur Ransome of London, that in cases of pulmonary character attended by cough, the most notable improvement, during the use of ozone preparations, consisted in the steady gain in weight of the patients treated.

Ozone water is placed upon the market in Europe under the name of electrozone, which contains about 3 per cent of ozone; and ozonol—that is, oil charged with ozone—contains about 6 per cent of ozone. In Germany, ozonol has, as a base, oil of almonds; and preozonol, a veterinary preparation, has oil of tar as a base. Both have been found to be great healing agents and antiseptics, at all times alleviating pain almost immediately.

THE SCIENTIFIC INVESTIGATION which the Government has ordered in regard to the conditions which exist in "Death Valley" is a matter of much interest to Californians in particular and to the scientific world in general. This desolate region, on the borders of California and Nevada, is only a strip of arid plain shut in between two mighty mountain walls, the peaks stretching up 10,000 feet into the burning sky. The surface of the plain is a deposit of salt and alkali. The expedition will be in charge of Dr. C. Hart Merriam, Chief of the Division of Mammalogy in the Department of Agriculture, and with him will be Dr. Vernon Bayley, one of the best collectors of mammals in the world, Prof. T. S. Palmer, the eminent naturalist, and others whose names are familiar to scientists. Many unfortunates have lost their lives by thirst in this desolate region, which owes its name to the melancholy fate of a party of emigrants who were trying to reach this State in 1852. The objects of this exploration are to locate places where water may be found; to collect specimens of animal, insect and reptile life which may be found within the valley and adjacent mountain-sides, and to collect, in general, every class of information which can be of any practical or scientific utility.

WHY LEAVES CHANGE COLOR.—The green matter in the tissue of the leaf is composed of two colors—red and blue. When the sap ceases to flow in autumn, and the natural growth of the tree is stopped, oxidation of the tissues takes place. Under certain conditions the green of the leaf changes to red; under different conditions it takes on a yellow or brown tint. The difference in color is due to the difference in combinations of the original constituents of the tissue and to the varying conditions of climate, exposure and soil. There are several things about leaves that even men of science cannot explain; for instance, why one of two trees of the same species growing side by side in the same soil should take on a bright red color in the fall and the other a pale yellow, or why one branch of a tree will turn a beautiful crimson, and the one just above or below it turn a dull brown.

EXPLOSIBILITY OF PETROLEUM.—In order to diminish the explosibility of petroleum, Korting Bros., Hanover, have devised a method which appears to be both simple and practicable. The explosiveness of petrolenm depends mainly on the degree in which the volatile carbureted hydrogen gas is mixed with the air. This carbureted hydrogen is, however, not given off by the crude oil, but only after rectification. Korting Bros. consequently endeavor to remove or neutralize it, and this they accomplish by blowing fine streams of a mixture of air, carbonic acid and steam through and through the petroleum until it is ultimately combined with it. By this treatment it is said that oil which otherwise would explode at 122° Fahr. is safe at 212°.

INFLUENCE OF LIGHT.—Italian physiologists have shown that change of tissue in animal organism is promoted by light. It is further found that the change is so slow in darkness that the ordinary reserve of nutriment stored in the body is sufficient to preserve one from starvation for a very long time.

TRACING STORMS.—Much progress has been made of late in studying the course, character and origin of storms on the Pacific Coast, and facts are being gathered and collated which will no doubt soon prove of much practical value.

GOOD HEALTH.

Medical Ethics in San Francisco and Berlin.

There seems to be a most decided contrast between the medical fraternity of Berlin and that of San Francisco. The telegraph, a few days ago, announced that a new remedy for diphtheria had been discovered by a German peasant, named Riegar, living near Berlin. Common report attached so much significance to it by reason of the great success which the poor, unlearned peasant met with in its application, that the story reached the ears of the now celebrated Dr. Koch, and friendly relations were at once established between the learned doctor and the poor peasant; and now we hear that the peasant's son has been called to Berlin and requested to experiment with the new remedy under the immediate supervision of Dr. Koch himself. The humane doctor is going to investigate and learn whether there may not be something of value to humanity in this accidental discovery alleged to have been made by a poor peasant.

What would our San Francisco surgeons and physicians have done under similar circumstances? Following the line of policy marked out and practiced by them, they would have refused all recognition of such "nonsensical quackery." They would have said to any one of their number who might have been anxious to investigate—"Hands off! Our code of ethics enforced by our Hippocratic oath forbids us to countenance any such quackery. We must stand by and let the children die of diphtheria until some one learned in medical lore shall have discovered and announced the discovery of some remedy better than any we now have."

In proof that such is the policy and practice of the medical profession of this city, we have only to call attention to the well-known fact that patients which our best reputed physicians and surgeons pronounce, beyond all doubt, afflicted with that most dreaded of all diseases, cancer, are constantly going to a well-known practitioner in this city, but one not of the dominant school, and are there being *cured* by constitutional treatment. Many of these patients, before leaving the regular faculty, submit to the cruel manipulation of the knife, and often *twice* without any beneficial effect. These facts are perfectly well known to every prominent physician in this city.

Do they follow the example of the German doctor? Not at all. They denounce in the strongest terms the practitioner—deny the cures, and when their own patients come back to them to prove what has been done, they refuse to talk with them and shut their doors in their faces!

The writer has often been asked why this is so. Why do our medical men refuse to look into this matter, so apparently important to the community? The most frequent answer is because the remedy is a secret and the profession will not experiment with a secret remedy. Herein lies the difference in practice between San Francisco and Berlin; for Dr. Koch keeps *his* remedy a secret to this day, and yet thousands of European physicians are experimenting with it.

Another equally common reason given is because the practitioner here is not in standing with the dominant school. To this we would answer, neither is the poor German peasant; yet as great and learned a man as Dr. Koch is ready and anxious to investigate as to what purports to be of benefit to the sick and suffering. The San Francisco physician is the proud pharisee who passes by on the other side, while Dr. Koch is the good Samaritan.

Then again, it is claimed, and correctly, that our friend is desirous of some remuneration for the discovery, which is contrary to medical ethics. There is nothing in the known world but medical ethics which makes such a demand. Common law, common custom and common sense say that the inventor or discoverer is worthy of a reasonable reward, especially when the discovery has been attained by many long years of investigation at great expense of money, time and health, to say nothing of the fierce opposition and obloquy which has been thrown at the effort by those who should have encouraged it, and who now demand the knowledge for the mere asking.

Further, we would reply that Dr. Koch keeps *his* remedy a secret and has already received a most princely reward in money, in addition to which honors without stint have been heaped upon him. Of course the doctor will make his remedy known to the world at the proper time. So will our San Francisco remedy be made known at the proper time and under proper conditions. There are philanthropists without number who stand ready to make good the compensation as soon as a proper medical investigation shall pronounce the cure a genuine one. Of course, time alone will prove its genuineness, but then, in the mean time, thousands are suffering and dying, while those who should investigate are doing nothing but putting hindrances in the way of investigation. That is not the way they do in Berlin.

Do they say there are no grounds for investigation? In reply, we would say that there is every day in the week waiting in a front parlor in this city, a large number of persons who have the authority of the most eminent physicians and surgeons of this city that they are afflicted with cancer. Some of these persons have been operated on in private offices and in public hospitals, and have subsequently been assured of the positive recurrence of the malady, with the assurance that the knife must again be used. These persons have afterward gone to the location referred to for treatment.

At that locality not less than twelve or fifteen has been the average number under treatment for the last five or six years—nine-tenths of which patients have been discharged as perfectly cured—*and not one single case of a return of the malady has been reported;* while when the knife is used, the books tell us that fully nineteen in twenty return within six or twenty-four months.

It has been intimated by some that these cases of cure were not cancer, but simply benign tumors. If such is the fact, what are we to say of the diagnosis of our leading physicians? Don't they know a cancer when they see it, and especially after they have cut it out, held it in their hands and put it under a microscope? Many and many cases have occurred and been successfully treated where the malady has returned after once and twice being cut out, and in one case after the third removal.

The only reasonable conclusion to which an honest-thinking man can arrive, after taking in the evidence, which is within the reach of all, is that either we have a remedy for cancer in this city or our leading physicians should be debarred by statute from practicing any longer in that specialty.

We desire that this statement should be received by our readers and the public as a most carefully considered utterance made after four years of most patient investigation, aided much of the time by medical gentlemen of undoubted standing in their profession, but whose names cannot be used in public because of the fearful professional pressure which is immediately brought to bear upon any medical person who presumes to make any inquiry into this matter of such vital interest to all. One of our medical advisers and assistants who was convinced that the discovery was a genuine one, and who attempted to bring the matter before the Medical Association of this city at one of its regular monthly meetings, was immediately put down, metaphorically stamped upon and the next day received a note that his assistance was no longer needed as a lecturer before the Cooper Medical College of this city. Others who have shown a desire to investigate have been threatened by word and by letter. The writer of these lines was present at the meeting referred to by invitation of a member of the association and was unceremoniously requested to leave the room, which he did after vainly endeavoring to make his excuse for being there. His voice was so completely drowned by the pandemonium of noise which accompanied his exit that he could not be heard ten feet from his person. We make this statement *now*, after four years of silence, as an evidence of the unseemly and unreasonable opposition of the medical fraternity of this city to allow any of their members to inquire into the truth or falsity of a medical discovery which we hold to be a better-proven reality than the alleged consumptive cure in Berlin and of fully equal value to mankind.

There are quite a number of gentlemen of standing, and several ladies also, not physicians, who have become sufficiently interested in this matter to join us in this inquiry, all of whom fully indorse the position we have taken in the matter and unqualifiedly condemn the course which our supposed health conservators are taking in regard to it.

In view of the importance of this inquiry, and the determined opposition thereto by those who should be foremost in aiding it, we appeal to the press to aid us in this work of humanity. All we ask for is an honest medical investigation. Let the State or City Board of Health or any other body of physicians select two or three cases such as they will pronounce cancer and proper subjects for the knife. Let those persons be placed under the treatment of Dr. Cook, and this vexed question will soon be practically settled. The doctor has for years been anxious for such a test. In common with all who have made inquiries into this alleged cure, we hold that the evidence fully warrants a demand for some such action, and we trust the press, not only of this city, but of the State generally, will unite with us in asking for a medical investigation.

But we have already quite overrun the space which we had allotted to this subject and will close with the remark that the name Koch is the German for the English name Cook, which latter is the name of the person who has discovered a cancer cure in this city—Cook of Berlin for consumption, Cook of San Francisco for cancer.

W. B. E.

USEFUL INFORMATION.

Taking Care of Ropes.

An article in a recent issue of the Chicago *Journal of Commerce* gives some interesting and valuable information regarding ropes, from which the following extracts are made: It is stated that the reason why it is necessary to take out the "tarns" in a new rope, and that it is untwisted when first put to work, is that in making ropes, the fibers are first spun into yarn, this yarn being twisted in a direction called right hand. From 20 to 100 of these yarns are then put together and twisted in an opposite direction, or left handed.

This forms a single strand or rope; from three to four of these strands are again twisted together, and it will be noticed that as this twisting is again in the right-hand direction, it untwists the strands and again twists up the yarn. When a weight is placed upon one end of the rope, its tendency is to untwist and become longer, and the untwisting will continue until the strain of the untwisted strand just equals the strain of the yarn being twisted together.

If it were possible, in making a rope, to put in just enough twist so that these strains should balance each other, then there would be no necessity for taking out the turns when a new rope is put to work. The greater the twist, the harder the rope, and to the contrary, a rope with little twist is much softer and stronger. The reason for this is easily seen, as in a tightly twisted rope the strain does not come as near in the direction of the length of the rope; that is, the fibers lie at a greater angle to the axis of the rope, and weight upon the rope forms a breaking instead of a stretching strain.

Ropes sometimes wear out internally while apparently sound outside. This is caused by bending the rope over a sheave. In doing this the fibers slide a small distance upon each other and eventually wear out. In the best ropes this wearing out is prevented by lubricating the strand with plumbago, mixed with a small quantity of tallow, just sufficient to hold it in place.

In designing pulleys, they should not be made less than 40 diameters of the rope; this is the limit of economical wear and they may be made as much larger as practicable. The speed of ropes may vary from 2500 to 5000 feet per minute. If five feet be taken as a minimum diameter of a pulley for a rope 1½ inches in diameter and running 2500 feet per minute, the pulley should increase one foot in diameter for each 1000 added revolutions per minute.

NEEDED INVENTIONS.—There is great need of improvements in insulating material. An insulation for wires is needed that will be cheap, light, flexible and durable; one that dampness will not decay, nor the heat of an electric arc dissolve or burn. A fire-extinguishing liquid is also to be desired which will be a non-conductor of electricity. When these have been obtained, and not until then, can the large telegraph offices be absolutely assured of protection from fire. Machines for sewing on buttons are greatly needed, but they seem to be just a little beyond our reach so far. When they come, if they do the work properly, rapidly and cheaply, they should be a pecuniary success.

TO SECURE VENEER TO ITS BASE.—A new method of securing veneer to its base consists in spreading glue or other adhesive matter between the veneer and the base, passing the two parts under a heated roller to melt the glue and cause it to enter the pores of the wood, then passing the connected base and the veneer under chilled rollers to harden and set the glue and prevent the warping or shrinking of the veneer consequent upon the gradual drying of the glue. This, it is said, will effectually secure the most obstinate piece of veneer in its place.

PROGRESSIVE KNOWLEDGE.—Some one says: At ten years of age a boy thinks his father knows a great deal; at fifteen he knows as much as his father; at twenty he knows twice as much; at thirty he is willing to take his advice; at forty he begins to think his father knows something, after all; at fifty he begins to seek his advice; and at sixty—after his father is dead—he thinks his father was the smartest man that ever lived.

THE DISCOVERER AND INVENTOR.—Mr. Edison, in a recent interview, draws this sharp distinction between a discoverer and an inventor: "I never try to discover anything—because I am an inventor. There is a big difference between a discovery and an invention. Discovery is an accident and an invention is a creation. Mr. Bell discovered the telephone; he did not invent it. I invented the talking part."

A PROCESS OF MAKING ARTIFICIAL CORK is by thoroughly incorporating 63 parts of ground or powdered cork chips with 180 parts of boiling starch paste. The resulting plastic mass is pressed in forms and then dried in hot rooms.

COLOR OF PURE WATER.—It has been quite fully demonstrated that pure, distilled water has a bluish color, independent of its surroundings.

TREES do not suffer from electric lights, as has been supposed. The electric light really aids vegetation.

SHOP NOTES.

HOW IRON WORKERS CAN STAND HEAT.—How the men employed in iron foundries and other places where big fires and blast-furnaces are in constant operation manage to stand the heat, is a mystery to all but the initiated. In the melting-room at the United States Mint the thermometer showed 106 degrees, at the gas works fire-room at Twenty-third and Market streets the mercury climbed to 118 degrees, and in front of the blast furnaces at the Baldwin Locomotive Works 115 degrees were registered. In all these places the men wore barely enough clothing to cover their nakedness. A man employed at the last-named place told a reporter that he did not feel the heat any more than did those who were walking about the streets, but he could not explain why this was the case. A subsequent interview with the weather man threw some light on the matter. "The whole point is," said he, "that these men are not reached by the humidity. They are working in places where the artificial heat is so intense as to drive out the humidity, and 118 degrees of heat in a pure, dry air is not felt so much as a mixture of 90 degrees of heat and 80 per cent of humidity that tells on people and sorely tries their vitality. The humidity is the moisture in the air. When it is very intense, it prevents the perspiration from passing out through the pores, and its pressure on the flesh is very exhausting, and the confinement of the perspiration exceedingly unhealthy. Although most people do not know it, they would be cooler while sitting beside a red-hot stove than they would be in the street on any of our warmest days."—*Philadelphia Record.*

TO PREVENT SLIPPING OF BELTS.—Edwin A. Kimball, instructor in the shops at the University of Illinois, says on this subject: "I do not know that washing soda may not be as good as castor oil, for I never used the former; but I do know that castor oil is effective and safe in the hands of a competent person. There is no occasion to soak a belt in any sort of oil. A little applied to the surface is sufficient. There is nothing that I have ever tried that is so effective as castor oil, especially for woodworking machinery belts. The way to apply it is to let it run from a bottle in a small stream on the belt while this is in motion, commencing at one edge of the belt, moving the stream over a little at every full travel of the belt, until the whole width of the belt has received its portion. I know of belts that have been treated in this way for years, and they are whole yet, and doing their work without a murmur."

KEEPING MACHINERY FROM RUST.—A mechanic says that in order to keep machinery from rusting he takes one ounce of camphor and dissolves it in a pound of melted lard, taking off the scum, and mixing in as much fine black lead as will give it color. The machinery is then oleaned and smeared with this mixture. After 24 hours, the machinery is rubbed clean with soft linen cloth, and it will keep clean for months. The same artisan gives the following method of hardening tools: Forge the tools into shape, then melt in a dish sufficient Babbitt metal to cover the end of the tool as far as it is wished to harden it. Thrust the tool into the metal and let it cool. This method makes the tool much harder than cooling in oil or tempering by any other process.

A CLEAN BLACKSMITH SHOP.—It would be worth the while of any one who always associates the idea of a blacksmith shop with smoke, soot, dirt and disorder, to inspect the blacksmith shop to be seen here. It is as free from these features as is any other part of the establishment, the walls being white, and the windows clean, everything in its place, and a general air of neatness pervading the whole shop. The entire absence of smoke is attributable mainly to the fact that the uptakes from the forges and furnaces lead into the main stack, in which there is sufficient draught to take care of it, and convey it outdoors, where it belongs.

A CORRESPONDENT of the *American Artisan* gives the tinsmiths a rule to find circumferences as follows: "This rule is of interest to those who do not know what we call the five magic figures to get the circumference of a pipe without a tapeline or a square. Take the figures following: 3, 16, 63, and multiply by 8, which means 8 inches in diameter; the correct size of the pipe without the edges will be 25 inches and 30 100 parts of an inch. Always use 31, 936. If one of the tinmen knows a better way, I will be pleased to hear it. This is intended for an 8-inch stack."

THE old-time watchmaker has gone to join the old-time shoemaker. Who gets the benefit of inventive genius there? The silver watch which retailed in 1880 at $20 now retails at $12. The set of knives and forks sold in 1883 at $6 now retails at $3. Everything in the store has suffered a reduction of from 33⅓ to 50 per cent. No gobbling up of all the benefits of improved methods there.

IF a shop hand could see how much rapping a pattern gets at a foundry he would leave out all idea of giving draught to iron gear teeth, and leave the spaces large enough so that the cast gears would not need such a cleaning-up to make them run free.

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Business Announcements.

[NEW THIS ISSUE.]

Assessment Notice—Inyo Marble Company.
Stamp Mill Wanted—L. H. Montanye, Albany, Oregon.

See Advertising Columns.

Passing Events.

Not much of special interest has occurred in mining circles during the week over which we cast a retrospective glance. While the great industry has been prospered in all its branches, there has not happened much of a startling or otherwise unusual character in any. As we have no great strikes to chronicle, so have we no painful accidents to record. All is serene and satisfactory. What ruffles the temper of the politicians and deeply agitates the commercial world creates not a ripple on the surface of the deep, steady current of mining events.

Even as we write, the clouds begin to distill from their alembic the latter rains, every drop of which the parched earth drinks up with avidity. Indications warrant us in hoping for a protracted storm. Mindful of the manner in which the first rainfall of the season failed us, ceasing before we had yet a sufficiency, our gratitude for this additional favor has not yet taken on a gushing form.

The threatened Indian outbreak seems to be in a fair way to be settled. A number of the redskins, including the wily Sitting Bull, were effectually settled in a fight that occurred between them and the Indian police a few days ago. The cold weather and the presence of the Blue Coats are likely to have a restraining effect on these malcontents.

Latest accounts from Ireland indicate a reaction in favor of Parnell, though there seems little hope that the contending factions will ever become wholly reconciled. In America public sympathy is with the great leader, who, if stricken down, will carry with him here the cause of Home Rule.

Growing Popularity of Free Coinage.

The enactment of a free silver-coinage law at the present session of Congress may now be considered certain. President Harrison, naturally conservative, and who has heretofore been a little wavering on this point, seems to have been about won over to the cause of free coinage. That he would not veto an Act providing for such measure were it to pass Congress, may be counted upon. The popularity of such movement throughout the West may be inferred from the fact that scarcely any of the members of the House who strongly opposed the free-coinage bill at the last session of Congress have since been returned to that body, their constituents having adopted this method of manifesting their disapproval of such course.

The masses of the people well understand that the money supply has not kept pace with the progress of the country in wealth, business and population; nothing can be clearer than this. It tells the whole story. The nation has grown, but the volume of the currency has stood still. These elements are out of all proportion to each other. In this prosperous and progressive republic the amount of money per capita is less than in any other highly civilized country. With us this sum amounts to only about $15; one-third and one-half as much as in France and England, respectively. We ought to increase the volume of our circulating medium at the rate of $200,000,000 per annum for several years to come, toward which we should coin our entire silver product into standard silver dollars.

The fear at one time entertained that the adoption of this policy would attract to the United States large quantities of silver from countries abroad, is shown by our experience since the passage of the silver-purchase bill to be without foundation. During the half year that has elapsed since that event our imports of the white metal have been $8,000,000; exports, $7,000,000. All this apprehended dumping of silver into the United States has amounted to, since the passage of that law, barely one million dollars, and this notwithstanding the effects of that law were largely discounted by foreign speculators in silver. What does this million dollars amount to? It is but a drop in the bucket in the finances of a country that has a money circulation of $1,200,000,000, and that produces every year over $55,000,000 of this same metal.

The truth is, this much-talked-of *dumping* process is all a delusion. These foreign nations have need of all their white metal at home, nor are they hoarding it up as is by some asserted. This is another fallacy. What silver they have is mostly in circulation. They require it for the ordinary transaction of business, more especially for effecting small change, just as we do here. They could not get along without it. The idea that silver is in any part of the world being stored in bank vaults, put away in old stockings or buried in the ground is sheer nonsense. In individual cases and to a small extent, silver, like gold, is hoarded everywhere, but in no country is this practiced in a large way, as why should it be when these metals can be loaned on good security and made to earn profits?

As the white metal has not by the passage of the Silver bill been attracted to this country in undue quantities, so has the yellow metal not been driven out of it by reason of the recent more free coinage of silver, aggregating more than three hundred million dollars, and their addition to the currency. On the contrary, gold has been coming to us and been in like manner added to the circulating medium.

With a view to removing every pretext for these simulated fears of the monometallists, the National Silver Committee has just recommended levying a coinage charge on all foreign silver that may be offered at any of the United States Mints, this being equivalent to a tariff on any such silver offered for coinage. This measure has been recommended by the committee not because they apprehend that any hurtful influx of the white metal is likely to occur, but simply for the reason above stated.

Latest advices from the East denote a general awakening on this question of enlarged silver coinage, not only in Washington but also in New York and the other great centers of finance and commerce. Not recently on any other subject has such a deep and widespread interest been excited in that quarter. At a meeting of the Republican Senatorial Committee held during the present week, Secretary Windom expressed himself as favoring the purchase and coinage of the entire surplus of silver bullion now in the country. This view having met with the approval of the committee, Senator Sherman has been instructed to draft a bill to be introduced in the Senate, the leading feature of which will be the purchase of $12,000,000 surplus silver within one year, not to exceed $3,000,000 in any one month. This will be in addition to the 4,500,000 ounces per month which the Secretary of the Treasury is now required to purchase and convert into coin. From all this it will be seen that a bill providing for the free coinage of the white metal is very likely to be enacted during the present session of Congress.

Christmas Thoughts.

Again the merry Christmas season is at hand. Again the city streets are thronged with people speeding to and from the marts which have spread new and tempting wares in the service of Santa Claus. Again the country hillsides are made to yield their annual tribute of green and scarlet, that the homes may express in evergreen foliage and bright-red fruit the ever-living Christmas idea and the ever-warm Christmas emotion.

The condition of our people and our industries favor the free outflow of holiday spirit. Peace and prosperity rule in our blessed land, while turmoil and suffering are unfortunately too prevalent elsewhere. Though we have issues which stir and excite the public mind, their settlement no longer calls for conflict and bloodshed. We have had our evil hour; let it suffice for a thousand years or until war becomes a lost art in the history of mankind. It is fitting, then, that we should make merry and be glad. It is fitting that the gentle spirit of Him whose birth we commemorate should pervade the people, and that peace, good-will and earnest thanksgiving should everywhere prevail throughout our land.

But the Christmas spirit is not one of selfish joy or self-gratification. On the contrary, it is happiness through the rich rewards of self-denial; it is reaping peerless pleasure while sowing happiness for others; it is the blissful emotion of giving—greater than that of receiving. He who gathers the most precious blessings is he who gives to those whose need is greatest, and to those who can but bestow in return only the homage of thankful hearts. Thus Christ gave and thus in a finite degree may we give also.

Thus the day becomes one to be observed thoughtfully and inquiringly. Blessed is he who provides for his own, but it is Christ-like to give gifts to those whose lives are darkened by want and whose claims upon the giver are but the angelic warrant—good-will to all men. It is our wish to emphasize this idea, which is the main spring of Christmas joy and the secret of true beneficence.

Handling Auriferous Black Sand.

EDITORS PRESS:—Will you please, if it is not too much trouble, inform me as to the best method or process for saving gold from seashore black sand that you know of and oblige an old miner.

JOHN COBURN.

P. O. Box 215, Tacoma, Wash.

In answer to the above, we may say we know of no better machine or method for saving the gold found in the seashore black sand than the common sluice with its usual accompaniments such as sacks, blankets, quicksilver, copper-silvered plates, riffles, etc. Many other machines and processes have been invented and brought into use for the purpose named, but on trial the most of them have proved so far failures, that the old-fashioned sluice and the rocker where but little material requires to be handled, still hold their place in practice.

THE annual consumption of crude iron in Germany has increased in ten years from 2,170,000 to 4,674,000 tons.

"That's What's the Matter!"

We live in an age of enlightenment and in a country notably rich in every form of natural wealth. We enjoy the advantages of liberal institutions and a free Government. Churches and schools abound, newspapers and other means for the cheap dissemination of knowledge being within the reach of all. And yet there are heard complaints among every class and on every hand. Look where we will and we see the evidence of much poverty, suffering and widespread unrest! The tillers of the soil and the toilers in the factories, the wage-payer and the wage-earner, the producer and the consumer, all are dissatisfied and clamoring for a change. Everybody is crying out for reform, an end that everybody hopes to reach by different means.

The grain-growers of the North and the cotton-planters of the South are anxious that the General Government should advance them money, at low rates of interest, on their lands and the products thereof; this done, these honest people fancy they would be prosperous and happy. As a cure for all the ills that flesh is heir to, the Nationalists would have the Government possess itself of all the telegraphs, the railroads and other means of transportation and operate the same in the interests of the people; this accomplished, the Nationalistic heart would be gladdened, and the whole world and the rest of mankind be relieved from the severer burdens of life. Intoxicants, say the Prohibitionists, are the cause of all our multitudinous woes. Stop then their sale and save the race. Give us greenbacks, say the advocates of that species of currency, and we will be all right. Adopt the free coinage of silver, exclaim the friends of the white metal, and the country is safe; gold or ruin, say their opponents. Single tax, shriek the landless disciples of Henry George, to which a great army of cranks respond, co-operation forever, community of interests or equal distribution of property being the panacea of the socialist and other proletarian bands.

Wherefore this clamor? Why this all-pervading discontent? Whence comes it and what does it mean? Let us look a little below the surface and see if we cannot detect other causes for most of these troubles than those ascribed by this vast concourse of malcontents. What about our growth in luxury and extravagance? Our costly amusements and pastimes? What about the time and the money expended in these? Looking back, is it not perceived how great has been the spread of these pernicious and costly practices of late years? How fearfully during this time has been the growth of the alcoholic, the nicotine and the morphine habit! How have the drinking saloons and the opium dens been multiplied among us, the simple beverages and healthful recreations of the olden day having been forgotten or converted into mere money-making devices.

It is now little else than a constant round of horse races, prize fights, rowing or wrestling matches, baseball or billiards, with a score of other pastimes and pleasures equally pernicious and expensive. How can a people hope to prosper whose intoxicants cost more than their clothes and their tobacco half as much as their bread? How can they hope to make money when, through the observance of holidays, holydays, fast days and Sundays, they lose fully ten per cent of their time? How can they expect to get ahead when they spend the bulk of their earnings in the indulgence of pleasure or in the purchase of articles wholly unnecessary if not absolutely hurtful? It cannot be done, and the sooner these suffering and complaining thousands come to realize this fact and act accordingly, the better for them and all others concerned. Let these deluded people emancipate themselves from their evil habits, economize their time and save their money, and there will speedily come an end of hard times. This is the true panacea, compared with which all these other reforms, even if practicable, would count as nothing. It is the case, indeed, that the inhabitants of these United States will have to largely amend their ways in the several particulars mentioned, or it will matter little to them whether these other reforms carry or not. A people who have surrendered themselves to mere pleasure-seeking and sensuality are already lost, or so near it that any effort made in the hope of saving them would be labor thrown away.

The Nicaragua Canal.

The accompanying illustration is a scene on the San Juan river, about half-way from its month at Greytown to the eastern border of Lake Nicaragua. This river flows through a beautiful country, and is at times broad and deep. The view given herewith is from a photograph taken from the deck of a river steamer. The portion of the river here shown will form a section of the inter-oceanic canal, now in process of construction. At the point of view it has widened out into quite an expanse of comparatively still water. A little beyond, it passes between two approaching hills, and is soon lost to view behind the bill on the left.

The State of Nicaragua is without doubt destined to become, at an early day, a most important field for American enterprise. All that is needed is a general and continued condition of peace between the little States which occupy this interesting and important portion of Central America. It is to be hoped that the recent unpleasantness, which appears now to have blown over, will be the last occurrence of the kind for at least one decade. With the construction of the Nicaragua canal and the consequent opening up of the country to American enterprise, it will not require a longer term than ten years to establish business relations which will act as a powerful lever in preventing war.

Nothing can exceed the beauty of Nicaraguan scenery. There is in it all the luxuriance of a tropical forest as seen on the Panama isthmus, without the deadly, fever-laden air. It would be difficult to find a more healthy or really salubrious country on the globe than the hills and valleys around Lake Nicaragua.

Since the decadence of the Panama canal enterprise and the commencement of active work on the Nicaragua canal, a very great change has been manifested in the principal Nicaraguan towns, especially those along the line of the proposed canal. Street cars have been introduced into Greytown, together with the electric light and other modern improvements. San Carlos, at the junction of the Rio San Juan with Lake Nicaragua, is rapidly assuming the proportions of a big town. Corinto, the Pacific seaport, is also growing rapidly.

A SHIP CANAL from Brussels to the sea is an old project revived by a new Brussels syndicate.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING DEC. 9, 1890.

442,471.—MACHINE FOR TURNING PILES, ETC.—A. Ames, Berkeley, Cal.

442,411.—RAILWAY CROSSING—W. M. Axtell, Fruitvale, Cal.

442,419.—WATER-CLOSET VALVE—Jos. Budde, S. F.

442,184.—TREE-TRANSPLANTER—A. Harpold, Colton, Cal.

442,486.—DRESSING TOOL—S. T. Harrison, Skipanon, Or.

442,186.—MINERS' CANDLESTICK—D. B. James, S. F.

442,441.—APPARATUS FOR REDUCING BITUMINOUS ROCK, ETC.—J. B. Jardine, S. F.

442,484.—CAN BODY MAKING MACHINE—M. Jensen, Astoria, Or.

442,444.—DOOR OPENER AND CLOSER—W. H. Leavens, S. F.

442,590.—WINDOW CURTAIN ADJUSTER—D. F. McDonald, Berkeley, Cal.

442,449.—HOISTING MECHANISM—W. F. Murray, S. F.

442,244.—FEEDWATER HEATER—David Stark, S. F.

442,468.—SHELF SUPPORT—O. F. Wegener, Seattle, Wash.

442,160.—CAR COUPLING—G. H. Williams, Albany, Or.

The following brief list by telegraph, for Dec. 16, will appear more complete on receipt of mail advices:

California—Mora M. Barrett and J. F. Daly, San Francisco, governor for gas engines; Edwin Bartsch, San Francisco, syringe; John Beermaker, Santa Barbara, sea and wave power; Elswood Chaffee, Santa Monica, assignor of one-half to B. H. Fairchild, Claremont, car brake; John H. Eichler, San Francisco, rotary gas engine; Samuel C. Lewis, San Francisco, machine for making rock-drill bits; Lanthus E. Marshall, Martinez, assignor of one-third to P. Tormey, Pinole, car coupling; William Meakin, San Francisco, machine for reducing bituminous rock; Roscoe B. Paige, Oakland, wheel for road engine; Presley B. Smith, Alameda, assignor to M. Morganstern and J. A. Behr, San Francisco, fountain pen; John C. E. Stut, San Francisco, engine; William Wainwright, San Francisco, vaporizing spray nozzle; Henry B. Ward, San Diego, pipe coupling; George C. Watris and L. Heymann, San Francisco, construction of roadbeds for street railway; Frank White and F. J. Murphy, Pomona, animal trap.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

RAILWAY CROSSING.—Walter M. Axtell, Fruitvale, Cal. No. 442,411. Dated Dec. 9, 1890. This crossing provides a solid foundation and connection for the different joints or sections of the broken or crossing track, and also bridges the otherwise open joints of said crossing track by making a continuous track without interfering with the use of the tracks crossed. The essential feature of the crossing is a connecting shoe or plate between the ends of the crossing rails and passing under the crossed rails, and in connection with this construction a fixed inclined plane on the crossing rail on the outside and a movable inclined plane of the crossing rail on the inside of the crossed rails, and guards which normally keep the joints closed but yield before the flange of the wheel traveling on the crossed rails. The crossing is applicable to any form of rail track.

PORTABLE HOISTING MECHANISM.—William F. Murray, S. F. No. 442,449. Dated Dec. 9, 1890. This device, which is a readily portable one, consists of a frame or base having a boiler and reversible engines mounted thereon, gipsies or winding-drums secured to a shaft journaled upon the frame, intermediate gearing whereby power is transmitted from the engine to the gipsey shaft to rotate it in either direction, racks fixed transversely upon one end of the frame, rings or links adjustable from side to side upon the teeth of the racks, and guide pulleys attached to and movable with said links to serve as leaders between the load and the gipsey, and to wind the rope fairly upon the leader.

APPARATUS FOR REDUCING, LAYING AND ROLLING BITUMINOUS ROCK, ASPHALT, ETC.—Joseph B. Jardine, S. F. No. 442,441. Dated Dec. 9, 1890. The object of this apparatus is fully expressed in the title. Its essential parts are a wheeled frame having a heavy roller at one end; the frame carries a boiler and steam engine; a series of hollow crushing rolls are mounted in a hopper and are heated by steam furnished from the boiler; a rotating conveyer is driven by the engine and said conveyer receives the material from the rolls of the hopper and discharges it at the end of the machine. The conveyer has a hollow shaft for a center and its screw blades are also hollow, both shaft and blades being furnished with steam from the boiler, whereby they are kept hot, and the casing in which the conveyer operates is also steam-jacketed. The whole apparatus is a complete and effective one for reducing the material, discharging it upon the road and rolling it.

HOMESTEADERS TO DOUBLE THEIR AREA.—It is announced by telegraph from Washington that the Senate Committee on Public Lands has authorized Senator Dolph to report favorably the bill introduced by Senator Mitchell to permit a person who has taken up 80 acres of surveyed lands under the homestead laws to extend the claim over 80 adjoining acres of unsurveyed land. An amendment was inserted to include settlers who have taken up land under the pre-emption law. Settlers may therefore look about them to see in which direction they can best extend their fences.

IT is reported that a number of wealthy Arabians purpose forming a fruit-growing and silk-raising syndicate in this country which will give employment to all immigrants from Arabia arriving in the United States.

A Most Useful and Valuable Book.

We have received a copy of a large and handsome volume, entitled the "Metallurgy of Silver, Gold and Quicksilver in the United States," being indebted to the publishers, John Wiley & Sons of New York, for the same. This book, prepared by Thomas Egleston, LL. D., Professor of Mineralogy and Metallurgy in Columbia College, is the second volume in a series of three, the last having not yet been completed by the author.

To say that this work equals any other ever published on the subject of which it treats would be faint praise. It is in our judgment the best book of the kind extant; nor can we see how it could well have been improved.

The text, clear in its statements and voluminous beyond precedent, is illustrated by numerous diagrams and cuts, an addition that tends greatly to enhance the value of the work; while sufficiently technical to meet the tastes and the views of the professional expert, the style is still so simple and the language employed so plain that everything said can be readily comprehended by the unskilled reader. Though evidently gotten up at great cost, this work is sold at the comparatively low price of $7.50. In San Francisco it can be had of the Bancrofts.

SCENE ON THE RIVER SAN JUAN.

MINING AND SCIENTIFIC PRESS. 1891. HANDY CALENDAR.

1891	Sunday	Monday	Tuesday	Wednes.	Thursday	Friday	Saturday
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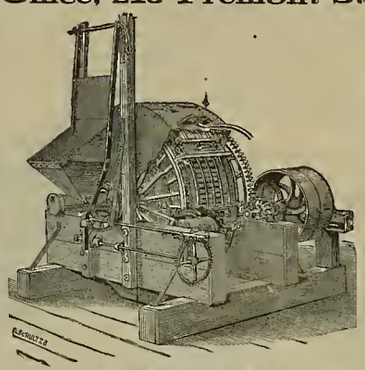

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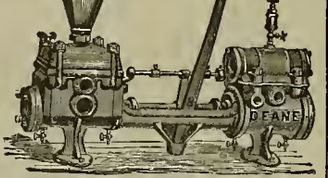

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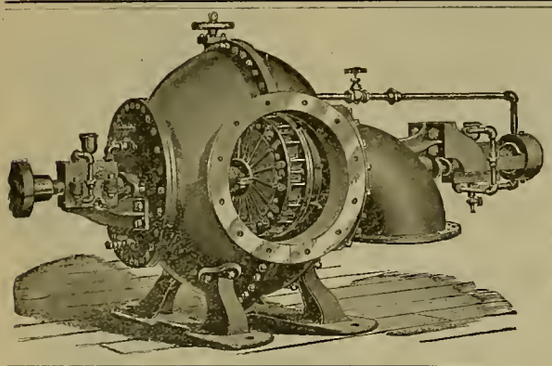

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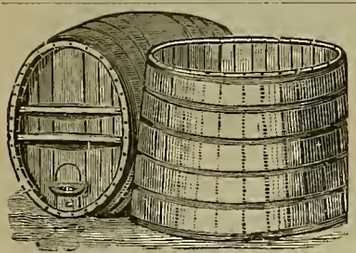

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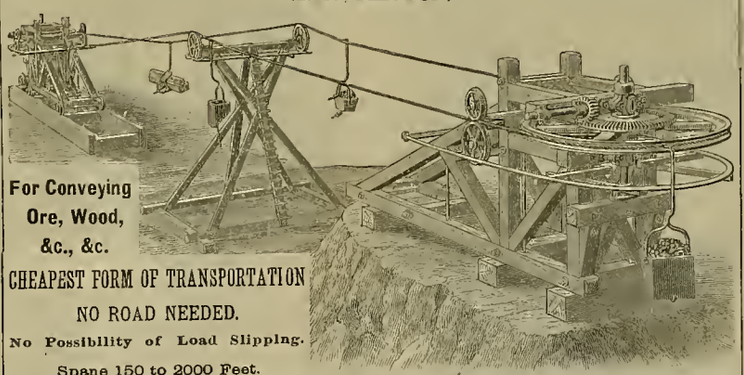

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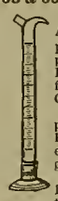

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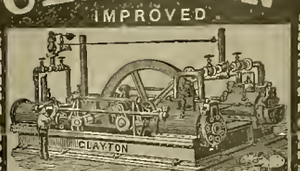

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Confidence Silver M Co	Nevada..	17..	75..	Nov 17..	Dec 22..	Jan 12..	A S Groth	414 California St
Cou New York M Co	Nevada..	4..	15..	Nov 12..	Dec 17..	Jan 6..	G E Elliott	309 Montgomery St
Con Imperial M Co	Nevada..	30..	5..	Dec 13..	Jan 8..	Feb 9..	G L McCoy	331 Pine St
Con St Gothard M Co	California..	2..	10..	Dec 9..	Jan 15..	Feb 7..	T Wetzel	320 Sansome St
Crown Point M Co	Nevada	53..	50..	Dec 3..	Jan 7..	Jan 28..	James Newlands	331 Pine St
Exchequer M Co	Nevada..	30..	25..	Dec 9..	Jan 15..	Feb 5..	O E Elliott	309 Montgomery St
Guasacaraa & Cal M & M Co	Honduras..	3..10	00..	Oct 28..	Nov 23..	Dec 16..	Edward Oliver	22 Michigan Ave, S F
Head Centre & Tranquility M Co	Ariz..	11..	5..	Dec 11..	Jan 16..	Feb 9..	J W Pew	310 Pine St
Inyo Marble Co	California..	11..	10..	Dec 16..	Jan 30..	Feb 20..	G W Luce	132 California St
Leigh Gravel M Co	California..	2..	5..	Nov 22..	Jan 3..	Jan 24..	E E Fall	320 Sansome St
Morgan M Co	California..	14..	10..	Oct 30..	Dec 6..	Dec 29..	L C Bresse	230 Montgomery St
Northwestern G & S M Co	Br Columbia	1..	5..	Nov 12..	Dec 19..	Jan 15..	E Bonacina	438 California St
Potosi M Co	Nevada..	35..	50..	Dec 16..	Jan 20..	Feb 10..	C E Elliott	309 Montgomery St
Riverside M & M Co		1..	10..	Dec 11..	Jan 12..	Feb 2..	J Stadtfield	309 Montgomery St
Tetakoff M Co	California..	5..	1..	Dec 6..	Jan 8..	Feb 9..	W J Gurnett	308 Pine St
Utah Con M Co	Nevada..	11..	25..	Dec 9..	Jan 19..	Feb 9..	A H Fish	Nevada Block

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F.	MEETING	DATE
Peer M Co	Arizona..	Nat Messer	Nevada Block	Annual	Dec 26
Peerless M Co	Arizona..	Aug Waterman	Nevada Block	Annual	Dec 26
Weldon M Co	Arizona..	Aug Waterman	Nevada Block	Annual	Dec 26

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Candelaria Cons M Co	Mexico..	G Gale	309 Montgomery St	25	Dec 3
Commonwealth M Co	Nevada..	R R Grayson	331 Pine St	20	Nov 20
Eureka Cons M Co	Nevada..	H P Bush	308 Pine St	25	Aug 5
Pacific Borax Salt & Soda Co	California..	A H Clough	230 Montgomery St	1 00	Dec 10

Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Nov. 25.		WEEK ENDING Dec. 4.		WEEK ENDING Dec. 11.		WEEK ENDING Dec. 18.	
Alpha	1.25	1.35	.95	1.30	.90	1.05	.75	1.05
Alta	.95	1.10	.90	1.10	.80	.90	.50	.75
Andes	.85	1.15	.80	1.60	.50	.85	.55	.80
Belcher	1.90	2.45	1.80	2.25	1.70	1.90	1.25	1.70
Best & Belcher	2.40	2.85	2.20	2.45	2.20	2.45	1.85	2.40
Bullion	2.35	2.60	1.75	2.30	1.85	2.10	1.45	1.90
Bodie Con	.75	.90	.90	1.10	.85	.90	.50	.90
Bulwer	.20	.25	.25	....	.20	....	.15	.20
Commonwealth	2.30	....	1.90	2.15	1.25	2.00	1.00	1.25
Con. Va. & Cal	3.60	3.90	3.15	3.60	3.05	3.20	2.55	3.10
Challenge	2.10	2.70	2.05	2.30	1.80	2.15	1.45	1.60
Chollar	3.45	3.70	2.75	3.60	2.35	3.05	1.95	2.80
Confidence	4.85	5.50	....	....	4.00	4.70	3.80	4.00
Con. Imperial	.25	.30	.25	.30	.20	....	.15	.20
Caledonia	.30	.35	.35	....	.30	.40	.25	.35
Crown Point	1.70	2.15	1.55	2.10	1.50	1.70	1.10	1.50
Crocker	....	....	....	....	.20	....	.10	.15
Del Monte	.60	....	.55	....	.50	....	....	....
Eureka Con	8.75	....	3.75	....	....	....	....	....
Exchequer	.75	.95	.85	.85	.60	.75	.40	.65
Grand Prize	.25	.30	.25	....	.20	.25	.15	.20
Gould & Curry	1.65	1.85	1.35	1.75	1.50	1.85	1.15	1.50
Hale & Norcross	1.95	2.20	1.60	2.00	1.40	1.75	1.15	1.55
Julia	.15	.20	.20	.30	.15	.20	.15	.20
Justice	1.10	1.30	1.10	1.15	1.05	1.15	.85	.90
Kentuck	1.30	1.55	1.10	1.50	1.05	1.25	.75	1.10
Lady Wash	.25	.35	.30	....	.25	....	.15	.20
Mono	.50	.60	.60	....	.50	.55	.40	....
Mexican	2.45	2.90	2.50	2.70	2.45	2.75	2.10	2.55
Navajo	.30	.35	.35	....	.25	....	....	....
North Belle Isle	1.20	1.25	1.00	1.20	.70	.90	.70	.80
Nev. Queen	.50	....	.75	.90	.50	.60	.40	.50
Occidental	1.00	1.20	.90	1.15	.85	....	.65	.70
Ophir	3.70	4.00	3.65	3.85	3.40	3.60	2.65	3.50
Overman	1.65	2.00	2.00	2.30	1.85	2.05	1.60	2.00
Potosi	6.62	7.00	4.70	6.50	3.80	6.50	3.70	5.12
Peerless	.20	.25	.20	....	.25	....	.15	.20
Peer	.50	....	.15	....	.10	.30	.15	.20
Savage	2.05	2.45	1.85	2.30	1.50	1.95	1.50	1.65
S. B. & M	1.10	1.40	1.10	1.35	1.05	1.10	.75	1.10
Sierra Nevada	2.05	2.35	2.00	2.20	1.80	2.10	1.40	1.90
Silver Hill	.30	.35	.25	.30	.20	.25	.15	.20
Scorpion	.20	....	.20	....	.20	....	.15	....
Union Con	2.10	2.30	2.00	2.20	1.95	2.15	1.50	2.05
Utah	.65	.85	.65	.75	.60	.70	.35	.55
Yellow Jacket	2.15	2.60	2.10	2.50	2.05	2.20	1.55	2.10

Sales at San Francisco Stock Exchange.

THURSDAY, December 18, 9:30 A. M.

200	Alpha Con	35c	
150	Alta	60c	
700	Andes	60@65c	
300	Belcher	1 30@1.35	
50	Best & Belcher	1.90	
50	Bodie	55c	
2	0 Bullion	1.60	
100	Bulwer	15c	
350	Challenge Con	1.60	
200	Chollar	2.05	
20	Con Cal & V	2.70	
10	Confidence	5.25	
500	Con Imperial	15c	
3	0 Con New York	20c	
450	Crown Point	1.10@1.15	
200	Exchequer	40c	
200	Gou d & Curry	1.20	
200	Hale & Norcross	1.15	
100	Justice	90c	
100	Ophir	2 70	
250	Overman	1.70@1.75	
520	Potosi	4.05@4.15	
200	Savage	1.55	
100	Seg Be cher	85c	
200	Sierra Nevada	1.50	
100	Union Con	1.55	
100	West Conte olo	40c	
100	Yellow Jacket	1.70	

San Francisco Metal Market.

WHOLESALE.

THURSDAY, December 18, 1890.

ANTIMONY		@	21
BORAX—Refined, in carload lots		8 @	—
Powdered " " "		8 @	—
Concentrated " " "		7½@	—
All grades jobbing at an advance.			
COPPER—			
Bolts		23 @	25
Sheathing		23 @	25
Ingot, jobbing		20 @	—
do, wholesale		18 @	18½
Fire Box Sheets		23 @	25
LEAD—Pig		5½@	—
Bar		6½@	6¾
Sheet		7¼@	—
Pipe		6¾@	—
Shot, discount 10% on 500 bags	Drop, ₱ bag.	1 90 @	—
Buck, ₱ bag		2 10 @	—
Chilled, do		2 30 @	—
QUICKSILVER—By the flask		.52 50 @	53 50
Flasks, new		— @	—
Flasks, old		45 @	55
CHROME IRON ORE, ₱ ton		10 00 @	—
STEEL—English, lb		16 @	20
Canton tool		6 @	9
Black Diamond tool		9 @	9
Pick and Hammer		8 @	10
Machinery		4 @	5
Toe Calk		4½@	—
TINPLATE—B. V., steel grade, 14x20, to arrive		6 37½@	6 50
B. V., steel grade, 14x20, spot		6 37½@	—
Charcoal, 14x20		6 50 @	—
do roofing, 14x20		6 00 @	—
do, do, 20x28		13 00 @	—
Pig tin, spot, ₱ lb., nominal		— @	23½
IRON—Bar, base		3 @	3½
Norway, base		4½@	5½

	Spot.		To Load.
IRON—Glengarnock ton	34 00 @	—	30 @ —
Eglinton, ton	34 00 @	—	30 @ —
American Soft, No. 1, ton	— @	32 00	30 @ —
Oregon Pig, ton	— @	33 00	— @ —
Puget Sound	34 00 @	—	— @ —
Bar Iron (base price) ₱ lb	— @	—	— @ —
Clay Lane White	— @	28 00	26 @ —
Shotts, No. 1	34 00 @	35 00	32½@ —
Langloan	34 00 @	—	30 @ —
Thorncliffe	34 00 @	—	30 @ —
Gartsherrie	34 00 @	—	30 @ —
Barrow	34 00 @	—	30 @ —
Thomas	33 00 @	—	— @ —
Dargollect	30 00 @	—	26 @ —

WANTED. A MAN WITH SOME KNOWLEDGE of practical and analytical chemistry wishes employment in a laboratory, metallurgical works, fertilizer factory, mine, or something of that character. Address B. C. H., 2133 Elm Street, Oakland.

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M. E. DOLAN—San Francisco.
SAMUEL CLIFF—Creston, Cal.
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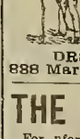

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Assessment Notices.

LEIGH GRAVEL MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 22d day of November, 1890, an assessment, No. 2, of five cents (5c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, 320 Sansome Street, Room 57, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 3d day of January, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on SATURDAY, the 24th day of January, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

E. E. FALL, Secretary,
Office, 320 Sansome Street, Room 57, San Francisco, California.

INYO MARBLE COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Keeler, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 16th day of December, 1890, an assessment (No. 11), of Ten Cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, 132 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of January, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 20th day of February, 1891, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

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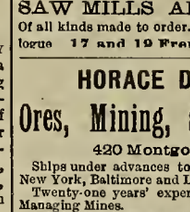

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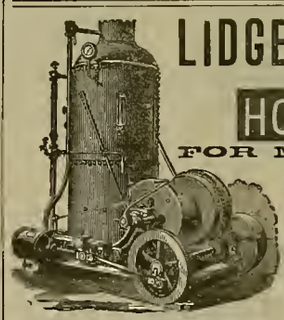

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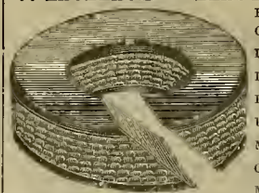

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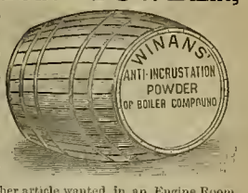

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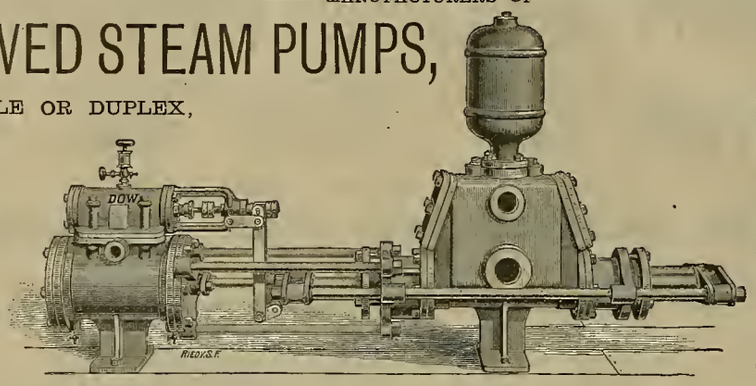

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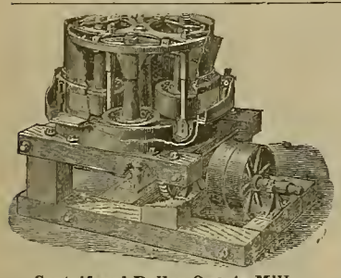

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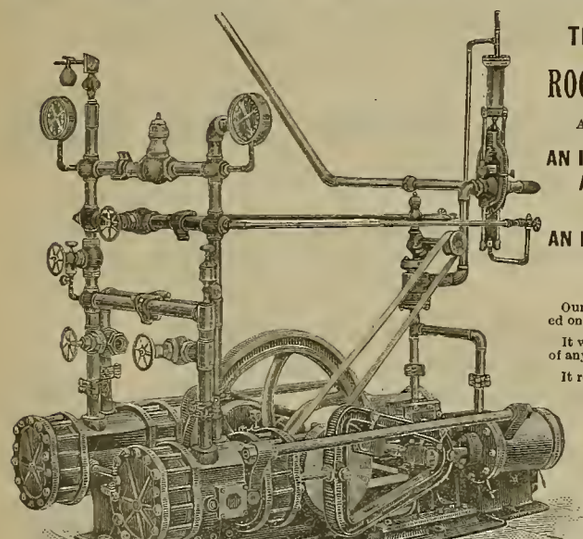

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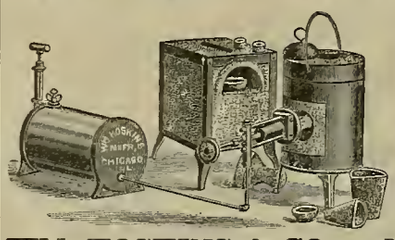

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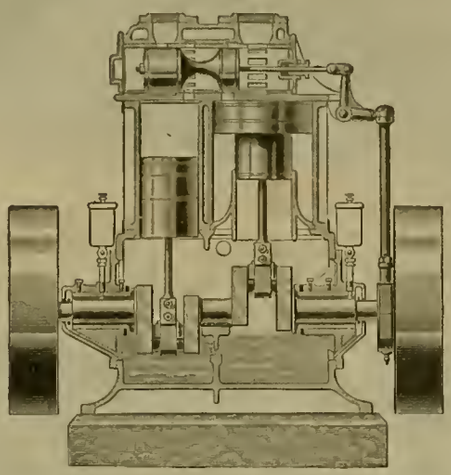

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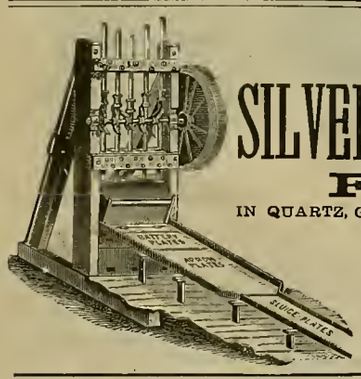

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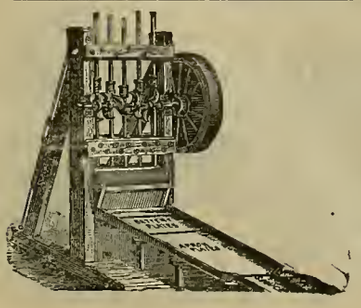

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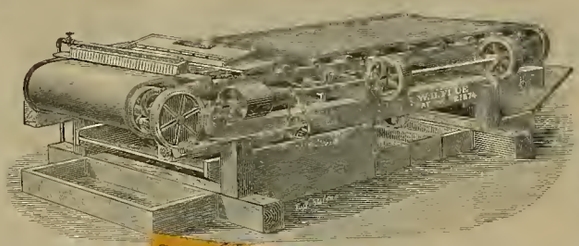

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N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

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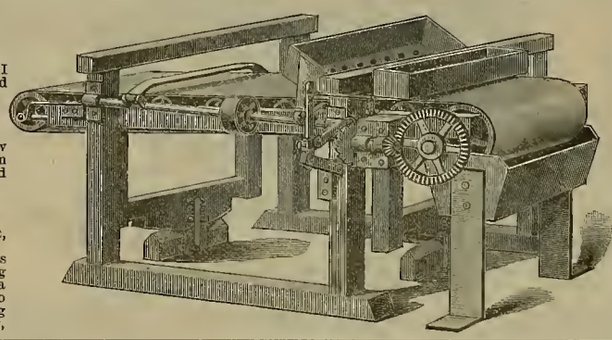
WOODSON GARRARD, Supt. Gold Cliff Mine.

HELENA & IDAHO GOLD MINING CO., SUPERINTENDENT'S OFFICE, GIBBONSVILLE, IDAHO, Oct. 6th, 1890.
MR. JAMES TULLOCK, Angels, Cal.—Dear Sir: Mr. Arnold was saying the other day that you were talking something of coming up this way, and I have thought that perhaps you might be a little uneasy about your concentrators. You need have no anxiety about them whatever, as the one we set up is running all right and has not given a minute's trouble since starting,



and the other one is all ready to start. They were so easy to set up and run that I forgot all about the "letter of instructions" until they were set up and running and you recalled to my mind your letter and instructions. Yours truly,
MYRON K. RODGERS, Supt.

ANGELS, CALAVERAS CO., Nov. 22, 1890.
JAMES TULLOCK, ESQ.—Dear Sir: We have used two of your Sulphuret Concentrators in the Madison Mill, (10) ten stamps, for over six months last past, and I hereby testify that they have given every satisfaction, and in every sense fulfilled the great opinion I had formed of their superiority. They are easily handled, readily kept in order, require but little watching, are exceedingly simple in construction and absolutely positive in their work. In my opinion, they are superior to any other in the market, doing effective work in the treatment of large quantities of sands. Sincerely yours, T. M. LANE,
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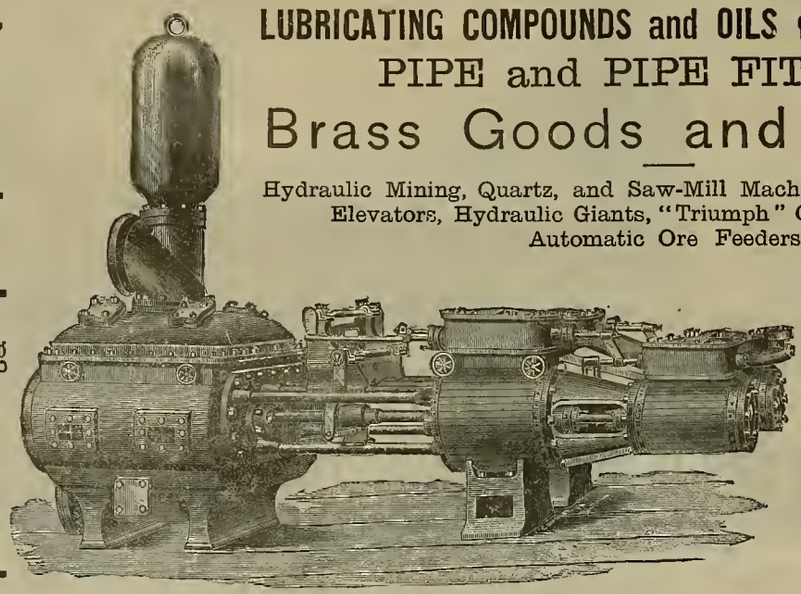

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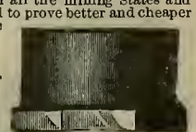

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An Illustrated Journal of Mining, Popular Science and General News.

VOL. LXI.—Number 25.
DEWEY & CO., PUBLISHERS.

SAN FRANCISCO, SATURDAY, DECEMBER 27, 1890.

Three Dollars per Annum.
Single Copies, 10 Cts.

AN IRRIGATING CANAL IN KERN COUNTY.

The Ennobling of Silver.

We had an interesting talk the other day with Mr. Albert Montpellier, Manager of the Grangers' Bank, on the financial situation. He called our attention to the significance of the incidents of the recent monetary crisis in England, which was averted by the shipping of $15,000,000 in gold from the Bank of France to the Bank of England. A letter from Paris, describing the incident, says:

This is the third or fourth time that the Bank of France has gone to the help of the Bank of England during the present century, and the explanation of it is very simple. The Bank of England has only one kind of metal in its safes and can only pay in gold, but the Bank of France can pay its way in silver, and so it does not have to go around borrowing gold when short of that metal. If the Bank of France is richer than its brother institution in London, it is because its vaults are filled with both gold and silver.

This chapter of French experience seems to have especial significance for us. Our growth as a country and the vastly increased volume of our commercial transactions call for an increased circulating medium. Plainly, we need more money to do business with, but we need also good money, not something which appears to be money but is not. This end could be accomplished by the remonetization of silver, that we could have both gold and silver to meet our needs, as has France.

The End of the Volume and the Year.

Having with our present issue reached the end of another year and another volume of the PRESS, we find in this concurrence of events suitable occasion for saying a few words about our labors in the past and our purposes in the future. Looking back over the year just closed, we find that it has brought with it much good fortune for this paper. Its circulation has been extended and its advertising columns well patronized, our friends having not only stayed with us, but many new ones having been gained. It is a satisfaction that carries with it something of a compliment, to know that after so many years there seems not to be need or even room for another purely mining paper in California, or indeed anywhere west of the Rocky mountains.

Construing this into an endorsement of our efforts to make and maintain a standard mining journal, we assure our friends that nothing shall be relaxed of our endeavors in that direction. Such generous recognition of our past labors brings with it not only large satisfaction but some recompense, the approval of our patrons and readers being worth to us not a little.

Finding in these expressions of confidence and good-will an incentive to still more strenuous effort, the course of the PRESS will hereafter be upward and onward, and whatever in the future may be its shortcomings, this much may be depended upon: its columns will not be lent to the promotion of any mere speculative enterprise or its influence prostituted in any shape or manner whatever. This paper, like many others, may sometimes be misled or imposed upon, but never will its proprietors knowingly permit it to be made the vehicle of misleading or imposing upon others.

Irrigating Canals.

The cut here given presents a view common in the great agricultural valleys of this State. We see here a large mountain stream which, having just debouched upon the plains, flowing between embowered banks, placid and pellucid, "glides on its soft winding way to the sea." Centrally, in the background, appear the foothills, so far off that they seem dim and shadowy, the mountains still farther back in which this river has its sources, being themselves so distant that they may not be shown in the picture. This omission the fertile imagination of the California beholder will readily supply.

The tortuous structure that comes in on the left is a flume that, having received the water from a ditch higher up, takes it down and across the river on the farming lands, where it is used for irrigation. Farther up in the foothills and mountains many of these flumes can be seen, their use there being to introduce water for driving machinery and for other mining purposes.

Chlorination.

[By WM. IRELAN, JR., State Mineralogist.]

This method of extracting gold from the auriferous sulphurets is recognized in the metallurgical circles of the Old World as the Plattner process, and is so called in honor of the inventor. The honor of its introduction and successful adaptation to the working of our sulphureted residues is due to the well-known mining engineer and metallurgist Mr. G. F. Deetken, by whom it was first brought into this country.

Owing to the expense of manipulation, cost of material, and other obstacles, Mr. Deetken had much to contend with; but his well-known skill and scientific ability enabled him to reach a successful issue and to become a metallurgical benefactor.

Since the demonstration of its successful workings on our concentrated sulphurets, a general knowledge of the manner of its application has been distributed by means of our scientific and other papers; also, books have been written by two of our well-known metallurgists, in which the whole process is explicitly dealt with.

The first of the above-mentioned works on the subject was issued by the late G. Kustel, in the year 1868, new edition 1880; and the latest exhaustive description is from the pen of Charles Howard Aaron, in 1881. Both authors were at the time of writing practically engaged in working the sulphurets of the State by this method.

The subject is inexhaustible, and of vital interest to the mining industry of our gold-bearing sections.

This article is not intended to give the detailed manipulations of the process, as the works above cited were written especially as working descriptions, and can be purchased of any of the booksellers.

The Roast.

This is the most important of any part of the process, and upon its completeness depends the success of the operation; therefore too much care cannot be exercised in this branch of the operation.

In roasting, the point to be attained is the complete oxidation of the baser metals whose soluble salts would become precipitants for gold in the leaching vat. If the concentrated sulphurets have become limpy, it will be necessary to recrush them, that the roast may secure complete oxidation.

It frequently happens that too much material is put into the furnace at one time. Mr. Aaron advises, for the reverberatory, from 10 to 12 pounds for every square foot of hearth as the correct charge. The furnace should be fired up several hours before being charged with the dry sulphurets, and the heat should be of a degree just sufficient to ignite the sulphur after the material has been evenly spread over the hearth. Too great a heat will matte the easily fusible sulphides, thereby necessitating a withdrawal of the charge from the furnace and a repulverization. The presence of galena requires a low temperature and continual stirring. Mr. Deetken discovered that the presence of lime and magnesia, owing to their affinity for chlorine, was a detriment to the chlorination of the roasted ore; but he overcame this difficulty by an addition of salt to the charge in the furnace toward the completion of the roast. The roasting in all cases should be done at a gentle heat until the sulphur ceases to burn, which point is indicated by the disappearance of the characteristic blue flame and the absence of scintillation on being raked. The heat is now increased and held at a high temperature until a thorough oxidation of the baser metals takes place. This can be ascertained by agitating, in a glass, a small quantity of the roast with water, allowing to settle, and adding to the clear decantation a few drops of the solution of ferrocyanide of potassium. If a dark-blue precipitate is given, sulphate of iron is present; if brownish-red, it indicates the presence of the corresponding copper salt; if both copper and iron are present, as soluble salts, the two colors will unite, forming a dirty greenish-blue mass. In either case the oxidation is incomplete, and the roasting must be continued until a further test does not give any of the described reactions.

Many operators continue the roasting to the oxidation of the iron only, but although it takes a longer time and a greater heat, it is advisable to also destroy the copper sulphate, as soluble metallic salts in the leaching vat react upon the iron oxide, which in turn precipitates the gold.

If the concentrated sulphurets contain silver, the Patera and Plattner processes should be combined. The silver is chloridized in the furnace by the addition of salt during the roasting. After the gold is washed from the ore, the silver chloride is leached out by a solution of hyposulphite of soda.

On the completion of the roast, the ore is drawn from the furnace to the cooling hearth, and after a time is sprinkled with water until moist enough to adhere when pressed in the hand.

The Leaching Vat.

In Europe the leaching is done in earthen or porcelain jars or tubs, wooden vats being condemned on account of their absorbing power. Mr. Deetken overcame this difficulty by coating the vats on the inside with pitch and tar. The vat is circular, and has a perforated false wooden bottom, which is raised about an inch from the real bottom. This false bottom is covered, first, with a layer of coarse, barren quartz; then a layer of smaller pieces; and lastly, a covering of clean quartz sand. Sometimes the sand is covered with gunnysacks or perforated boards. The damp roasted pulp is sifted into the vat and spread evenly and loosely until within about three inches of the top. The chlorine gas is now introduced through an opening in the bottom of the tank until it rises to the surface of the ore, which will be known by dense white fumes of chloride of ammonium being given off when a rod or stopper moistened with ammonia is held close to and above the charge. At this point the cover is put in place and carefully luted with some suitable tenacious substance that will not crack in drying. The chlorine is continued until the space above the ore is filled with the dense yellowish-green vapor; then the plug-hole in the cover is stopped and the vat and contents are left at rest for from one to two days, at the expiration of which time the gold should be converted into a soluble chloride. Before leaching, the plug in the cover should be removed and the ammonia test applied. If there are no resulting white fumes, the ore must be again subjected to the chlorine, and so continued until the ammonia reaction is given.

The chlorine is generated in a leaden vessel from a mixture of common salt, peroxide of manganese, sulphuric acid and water. The reaction chemically given is: $2\ (Na\ Cl) + 2\ (H_2\ SO_4) + Mn\ O_2 = Na_2\ SO_4 + Mn\ So_4 + (H_2\ O)_2 + 2\ Cl$.

Care must be taken in using the chlorine gas that no muriatic acid enters the leaching vat, for, besides attacking the oxides of the metals, should there be an imperfect roast, the sulphides would be attacked, eliminating sulphureted hydrogen gas, which would precipitate the gold from the chloride solution. The chlorine is deprived of the muriatic acid after leaving the generator on its course to the vat, by passing the gas through water.

Lixiviation and Precipitation of the Gold.

The ore being thoroughly chlorinated, the cover is removed and water run into the vat until it rises above the surface of the mass. After a few minutes, when the water has had sufficient time to permeate all the ore, and still covers the surface, the plug at the bottom of the vat is removed and the liquor conducted to the settling tank into which has been put the precipitant for gold—a solution of sulphate of iron. A continuous flow of water must be admitted into the leaching vat, and at no time during the operation, which lasts several hours, should the water be permitted to fall below the surface of the ore. At intervals a glass full of the liquor, after having left the leaching vat, should be taken and thereto a little of the sulphate of iron solution added; if gold were present a bluish black precipitate would be given. In the event of any precipitate resulting from the unity of the two solutions the washing is not finished but must be continued until the precipitant added to a freshly taken portion of the liquor does not give any reaction, or at the most only a faint coloration.

After a thorough stirring of the contents in the settling tank, the precipitate is allowed to subside, and a glass full of the clear liquid taken, to which is added a little of the sulphate of iron solution; if a dark coloration is given, more sulphate of iron must be added to the liquor in the tank; or, if on the addition of a few drops of gold solution to a little of the clear liquid from the tank, no reaction is given, it is a confirmation of the former test that there is a deficiency of sulphate of iron.

Should the roasted ore contain chloride of silver, it is leached with a solution of hyposulphite of soda, after extraction of the gold by water. The liquor is run into a tank set aside for this especial purpose, in which the silver is thrown down by a solution of calcium sulphide, as sulphide of silver. The outflow of the silver solution should be conducted slowly, by the closing at intervals of the discharge pipe, as the silver salt is not so readily extracted by its solvent as is the gold.

The presence of silver in the hyposulphite is known by the sweet taste of the liquid; but when it can be no longer detected in this wise, a little of the outflow is caught in a glass and a few drops of the calcium-sulphide solution added; if a dark precipitate is given, it is reasonable to suppose that the silver has not been entirely extracted, although other metallic salts, giving similar reactions, are also washed out by the same solvent. The only recourse at this point is to apply the confirming tests for such soluble compounds, as it is almost impossible to decide by the coloration which metals may be present. After the silver precipitate in the settling vat has subsided, a little of the calcium sulphide is added to the clear solution, and if a dark coloration is the result, it is evident that more of the precipitant must be added.

After the tests have shown a thorough precipitation of the gold and silver, the tanks are left undisturbed until the suspended precipitates have settled.

Silver.

The silver precipitate will settle in a few hours, when the clear solution may be drawn off, the silver sulphide collected, conveyed to a filter, washed thoroughly with hot water, pressed, dried and then roasted in a furnace—first, at a heat just sufficient to drive off the greater part of the sulphur; at this point the temperature should be increased to a dull red, and so continued for several hours, or until the greater part of the silver becomes metallic.

The partly metallized substance is placed with borax and iron scraps in a black-lead crucible and fired until thoroughly melted; enough iron should be added that it does not all disappear in the operation. If an iron rod immersed in the molten mass, and allowed to remain a few minutes, shows no signs on removal of having reduced in size, the iron scraps should be removed, the matte and slag skimmed off, and the metal poured.

Gold.

The contents in this tank should remain at rest for at least 40 hours, for under that time a complete precipitation and settling of the gold cannot be insured. When the gold has all settled at the bottom of the tank the clear liquid is drawn off, the gold collected, filtered, washed several times with hot dilute hydrochloric acid, and lastly, with hot water, until all traces of acidity are removed. The gold is now dried, melted in a black-lead crucible with borax, skimmed, base metals in a measure removed by the addition of niter, a little at a time, reskimmed and poured.

The importance of saving sulphurets and working them by this process is shown in the annual statement of the Sierra Buttes mine. From 1872 to 1885 the sulphurets were collected by the Hendy concentrator, and after exposure to atmospheric oxidation, were worked in the combination Stephenson-Patton pan. In 1885 the company erected chlorination works at a cost of $5000, by which they have added a yearly profit of $60,000 to the yield of the mine.

The ore of the Zalle mine is crushed with special reference to saving the sulphurets; the crushings being sized to pass through a No. 4 slot screen, as finer particles would be more difficult of concentration.

Exploring the Canyons of Colorado.

Colonel Holabird of Los Angeles has just returned to California from an exploring expedition in the canyons of Colorado. He penetrated districts never before explored, it is said, and found in an almost inaccessible canyon 100 miles north of Williams, and near the Grand Canyon of the Colorado, the Yava Supai tribe of Indians, who had never seen any white man except John D. Lee, the Mormon, who was shot for the Mountain Meadows massacre. Colonel Holabird, in relating his experience to a New York *Tribune* correspondent, said:

"These Indians are of the Apache family, but of ancient origin. The men are magnificent specimens. The valley in which the tribe has lived for many years in seclusion has only two ways of approach. It contains 2000 acres and is inclosed by almost perpendicular walls 4000 feet high. We traveled over 15 miles along a canyon over a lifeless country. Suddenly we came to two boiling springs under cottonwood trees. From these springs a river starts, which winds its way through a luxuriant valley. The water in the river is as clear as crystal and so strongly impregnated with lime that it petrifies everything it touches. There are three immense cataracts in the canyon. These look as if centuries ago a huge cottonwood tree had fallen across the stream and lodged. Mosses, ferns and creepers had formed a barrier; all these turned to limestone. The grass caused the deposit to increase until the barricade extends across the canyon making a fall of 250 feet. Along the front of these high cataracts limestone ridges have formed 20 to 50 feet one above the other. Over all these the water falls like a sheet of glass. Underneath, between the ridges, thousands of plants with flowers in full bloom are seen, while millions of humming birds dart in and out. The chief of the strange tribe is an old man of 60, 'Captain Tom.' The name was given him by John D. Lee. I found these Indians in a starving condition, subsisting on berries and grass seed. I appealed to the Government for them, but the Indian Department said it couldn't help wandering people." General Miles, who says he has heard of these Indians, but could never get a guide to their canyon, will investigate their condition.

SOME instructive and at the same time interesting statistics of the war are to be found in the Fox history. Out of 2,000,000 soldiers three-fourths were Americans. Of the 500,000 of foreign birth, Germany furnished 175,000, Ireland 150,000, England 50,000, and other countries 75,000. The average hight of the American soldiers was 5 feet 8½ inches. The men from Maine, Indiana, Iowa, Missouri and Kentucky were slightly above this figure. West Virginia's soldiers averaged 5 feet 9 inches. The average would have been greater had boys from 17 to 20 years not been included. Out of the 1,000,000 recorded hights, there were 3613 men over 6 feet 3 inches tall, and among them were some over 7 feet. Regiments and brigades could have been formed that would have surpassed the famous giant guards of Frederick the Great. The average weight of the soldiers was 143½ pounds. The tallest man in the service was Capt. Van Buskirk of the 77th Indiana, for whose stature the testimony is complete that he stood 82½ inches in his stocking feet. The shortest man in the army was one in the 192d Ohio regiment. He was 24 years old and was 40 inches in hight. The colonel of the regiment says he could endure exposure and fatigue with the best.

Mountain Sheep.

Nearly all the lofty mountain chains of the globe are inhabited by wild sheep, that rank the highest among animal mountaineers. Possessed of the keenest of sight and scent, with strong limbs, they live, says the St. Louis *Globe-Democrat*, secure amid the loftiest peaks, leaping unhesitatingly from one crag to another or jumping unscathed down the side of bold precipices. Although exposed to the wildest storms and most rigorous weather, they show no evidence of suffering, but apparently enjoy the best of health. Naturalists classify these wild sheep under five distinct species. There is the American bighorn, or Rocky mountain sheep; the argali, found in the principal ranges of Asia; the burrhal of the upper Himalayas; the Corsican mouflon, and the African wild sheep. To the American bighorn species belong the wild sheep of the Sierra Nevada. They are found in the Upper Missouri and Yellowstone regions to the Rocky mountains, south as far as the Rio Grande and in the ranges of Washington and Oregon. All the many mountain summits within these limits, rising thousands of feet above the sea-level, are more or less inhabited by them. Compared with the best-known domestic breeds, the wild sheep are more than twice as large, with the wool covered by smooth, soft, thick hair. The color is brownish-gray, with the under parts and haunches white and the tail black, bordered with yellow. The wool is always white, and grows in beautiful spirals down out of sight among the straight, shining hair, like delicate climbing vines among stalks of corn.

The horns of the male are of immense size, measuring in their greater diameter from five to six and one-half inches, and from two and one-half to three feet in length around the curve. They are yellowish-white in color, and ridged transversely, like those of the domestic ram. Their cross-section near the base is somewhat triangular in outline and flattened over toward the tip. In rising from the head they curve gently backward and outward, then forward and outward, until about three-fourths of a circle is described, and until the flattened, blunt tips are about two feet apart. Those of the female are flattened throughout their entire length, less curved than those of the male, and much smaller, measuring less than a foot along the curve. The average weight of a full-grown male is 344 pounds.

Another difference from the tame sheep is that the wild is bold, daring and graceful, with every bit of the body and feet as smooth and clean as the grass of the mountain pastures. In the writings of many of the earliest travelers in America, reference is made to the "big-horns." A Catholic missionary to California in 1797 tells of a wild deer with a head like a sheep, that has flesh tender and delicious to eat. Where they have long been hunted, as in the neighborhood of the passes in the California Alps, they become very shy, but in the retired wild canyons and about the almost inaccessible peaks, they are no more timid than the sheep in a farmer's field. In the months of November and December, and probably during a considerable portion of midwinter, they all flock together, male and female, old and young.

In spring and summer the full-grown rams form separate bands of from 3 to 20, and are usually found feeding along the edges of glacier meadows or resting among the castle-like crags of the high summits; and whether quietly feeding or scaling the wild cliffs for pleasure, their noble forms and the power and beauty of their movements never fail to strike the beholder with living admiration.

Their resting-place seems to be chosen with reference to sunshine and a wide outlook, and most of all to safety from the attacks of wolves. Their feeding-grounds are among the most beautiful of the wild gardens, bright with daisies and gentians and mats of purple bayanthus, lying hidden away on rocky headlands and canyon-sides, where sunshine is abundant, or down in shady glacier valleys, along the banks of the streams and lakes where the plushy sod is greenest. Here they feast all summer.

When winter storms set in, loading their highland pastures with snow, then, like the birds, they gather and go to warmer climates, usually descending the eastern flank of the range to the rough, volcanic tablelands and treeless ranges of the Great Basin adjacent to the Sierra. They never make haste, however, and seem to have no dread of storms, many of the strongest only going down leisurely to bare, wind-swept ridges to feed on bushes and dry bunchgrass, and then returning up into the snow.

In the months of May and June they bring forth their young in the most solitary and inaccessible crags, far above the nesting-rocks of the eagle. I have frequently come upon the beds of the ewes and the lambs at an elevation of from 12,000 to 13,000 feet above sea level. These beds are simply oval-shaped hollows, pawed out among loose, disintegrating rock-chips and sand upon some sunny spot commanding a good outlook, and partially sheltered from the winds that sweep those lofty peaks almost without intermission.

Like the Ibex of Europe, the Rocky Mountain sheep do not hesitate to plunge headlong down the face of a precipice and alight on their horns. The horns are so large at the base that they cover all the upper portion of the head down nearly to a level with the eyes, and

the skull is exceedingly strong; hut more often, when making a hig jump, the sheep will alight on their feet. Not only are their legs strongly muscled, hut on the hottom of the feet are hniging pade. Theee serve to hreak the shock of a jump and enahle the sheep aleo to keep their feet nn an incline.

The only animal that may fairly be regarded as a companion of the sheep is the Rooky Mountain goat, which is more antelope than goat. He, too, is a hrave and hardy climher, fearlessly accompanying the sheep on the wildest summits and hraving with him the severeet storms, hut emaller and much lese dignified in demeanor. His jet-hlack horne are only five or six inches in length, and the long white hair with which he is covered most ohscures the expression of his limhs. In some portions of the Rocky and Cascade mountains it occurs in flocks of conciderahle size, where it is eagerly pursued hy the Indians, who make uee of its ekin in various waye ae clothing, that of the head with the horne attached heing eometimee worn ae a cap.

A Model Crematory.

We have received from George Sineahaugh, Secretary of the Cremation Society of Southern Calilornia, the following deecription of the cremation furnace hullt hy that eociety, together with a etatement of the rulee and regulations by which they are governed in their dealinge with the puhlic and in the performance of the crematory rite. This etructure is undouhtedly one of the most complete and well appointed of its kind, having heen patterned after the heet modele extant.

EDITORS PRESS:—The Cremation Society of Southern California has had an exietence of ahont three yeare. A numher of citizene of Loe Angeles, realizing the importance of a more intelligent method of treating the hodies of the dead, decided to form a eociety, acquire land, incorporate, leeue etock and huild a crematory, which they have done in the Roeedale cemetery, located on the National houlevard, heing the extenelon of Washington atreet, on the western houndary of the city of Loe Angelee.

Our hullding conciete of a neat chapel conneoting with the furnace-room hy a large eliding-door. The main object of the society has been to furnieh a quick and powerful heat without allowing the flames to come in contact with the hody. No direct currents of air pass over it; the heat is still and of a temperature of ahout 2000°, doing its work in less than an hour, and permitting none of the eesential particles to escape.

The retort and furnace have heen modeled after the plan adopted hy Dr. F. J. LeMoyne of Washington, Pa., which was the first crematory hullt on the continent.

Onra was hnilt hy John L. Dye, the same person who hullt the one at Washington, with improvemente of hie own devising, which make it, perhaps, anperior to any other in the conntry, and it does its work more effectively than orematoriee ahroad that have heen hullt at ten times the cost of oure. No other crematory exiete west of the city of St. Louis. We have had ahont 40 cremations, all of which in every instance have heen highly satisfactory in their methods and results. Caskets have heen sent from along our entire coast from Seattle to San Diego, and from varlous intermediate pointe.

To those who may eend caekete from a dietance and who cannot themselves be present, we may say that all care is taken in handling hy soher, reliahle and competent men, no other helng allowed on the premieee. Many write to ne for particnlars of cost, etc., to which we give anewer as follows: The cost of cremation is eeventy-five dollare; of transportation hy hearee from depot to crematory, five dollare; of metallic hox or nrn to contain the ashes, from two dollare to a greater cost, according to the wishes of thoee interested. Bodies sent from a dietance ehould he emhalmed.

Caskets need he need only for traneportation and may he of an inexpeneive kind, and must he removed lrom the crematory within fifteen daya from delivery, or if not so removed, will then he deetroyed. In view of this determination of the aeeociation, partiee will please give notice, at the time of sending the hody, what dieposition they wieh made of the caeket.

Upon due notice heing given, the remains will he met hy the superintendent and taken at once to the chapel. Notice for heating should he given at leaet thirty-six hours in advance of the time for cremation. The ashes will he properly cared for, and eent hy expreee, ehould partiee not deeire to he preeent to take charge of them, or retained hy the company.

GEORGE SINSABAUGH.

601 Broadway, Los Angeles, Cal., Nov. 1, '90.

The Fall of Babylon.

The origin of Bahylon ie wrapped in ohecurity and its exact site was a matter of controversy nntil recent explorations nncovered the ruins of the city and disclosed material which verifies many of the etatements of the ancient historians.

According to Herodotns the city of Bahylon stood on both sides of the river Enphratee, in the form of a square, of which the sides were 15 miles each. The walls inclosed rather popnlous districts than citiee, eo that the whole population might find shelter within the space inclosed. Though the area of the city was thus large, its chief hnildings were adjacent, and it was at this part of the city that the artist chose to deplct the wonders of the city and the entrance of the invadere. It will he remembered that Cyrns the elder diverted the river Enphrates from its channel, while Belshazzar was feasting and thus prepared the way for the entrance of his men through the old river-hed which paseed heneath the walls of Bahylon. Thus the great city fell into the hands of the invader in the year 538 B. C.

THE INVASION OF BABYLON BY CYRUS THE ELDER, B. C. 538.

It was during this crowning disaster to the greatest city of the East that the artist times his portrayal. In the nncovered hed of the stream the troops of Cyrus are seen advancing, while the grounded ships are hnrned to light their pathway. On each side of the river are seen the two great palaces, while on the farther side are the temple of Bslus and, heyond, the unfinished tower of Bahel. Fire is attacking the proud structurce on all sides. In the foreground, lighted hy the conflagration, are seen the guests of the feast of Belshazzar coming forth from feasting to carnage. Upon the right is a scene in the "hanging garden;" the flight of the inmates from the hurning palace.

This "hanging garden," which is always suggested when the name of Bahylon is spoken, the Greeks regarded as one of the Seven Wonders of the World. This singular structure, which is ascribed to Nehnchadnezzar, was a square, each side of which measured 400 Greek feet. It was supported on several tiers of open arches, hullt one over the other and sustaining at each stage or story a solid platform, from which the piers of the next tier of arches rose. The top of the building, which was ahout 75 feet high, was covered with a large mass of earth, on which grew flowers and shrubs.

Lumber Business of the Northwest.

"The lumher husiness in this country," said a prominent millman, "is not what it is generally thought to he. Money invested in the husiness in Minnesota, Wisconsin, Michigan and Pennsylvania gives much greater returns than in this country.

"I have heen in the husiness in this State now for several years, and formerly was so engaged in the Eastern States, and when I make the above assertion I know what I am talking ahout. True, there are a great many companies that have hecome immensely wealthy hy manufacturing and handling Washington lumher, but again there are many who have lost, and even were compelled to withdraw from the husiness. The reason is not hecause of the scarcity of timher or hecause of its quality, hut for the want of a market. All of the mills cannot find a local market. The few centers of population do not consume sufficient to keep them all going, and as a result competition in the local market has made the husiness unprofitahle. Some few of the exporting firms are making money, while others are not. Lumher sent ahroad is suhject to foreign prices, and at times the consignments may result in large profits, while at other times they result in a loss. The marine tonnage at present is insufficient, and no increase in the export trade can he made, and as a result the immediate improvement of the industry cannot he looked for. In order to do an exporting husiness, large capital is required; the many small mill companies are compelled to depend entirely on the local market.

"And again, another thing that tends to make the husiness less profitahle here is the large wages paid. The wages paid here to the common laborer ahout a mill, up to the superintendent, are ahout 40 per cent more than in the East. This in a year's time amounts to a hig item; and then again, the machinery required in the mills here is of a much more expensive nature than that used East."—*Seattle Press.*

HOW TO TRANSFER PRINTS FROM NEWSPAPERS TO GLASS.—Varnish glass with gum dammar. Soak print in water. When varnish is nearly dry, rub on the wet print and allow it to dry. When varnish is hard, rub off paper with wet finger.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

Alpine.

GOLD FIND ON EAST FORK OF CARSON RIVER. Genoa *Courier*, Dec. 20: For years the fine float gold along the East Fork of the Carson river has attracted the attention of prospectors in that locality, but only a few have found gold enough to remunerate them for their labor. Prospectors have scanned the hills from the place where the Carson river emerges from the mountains up as far as Silver mountain, in a vain effort to find the fountain head—the main ledge from which the float gold is supposed to have come. It was something like a year ago that Marshall Willard told this writer that he had his eye on a spot that he believed would lead to the coveted ledge. Mr. Willard says that about two years ago, in company with his partner, J. K. McDonald, and Orson West, he came down the river and camped at Horseshoe Bend. At that point Mr. Willard prospected the croppings of a ledge, and out of 22 horns taken from different places across the ledge he got 20 good prospects. A short time ago Mr. Willard made further prospects, and interested over 20 people in the valley, who joined with him in locating 11 claims, which take in a scope of three miles along the river, Horseshoe Bend being the center. Mr. Willard describes the ledge as running 15 degrees east of south and 15 degrees west of north. The croppings show it to be from 18 to 20 feet wide on the surface, and lying back of a lime formation which contains traces of quartz. The ledge matter consists of iron and quartz mixed, and he believes it will be considerably decomposed when depth is attained. The river cuts entirely through the ledge in places and shaves it at other points. Wherever the river has exposed the ledge, signs of placer mining can be seen a short distance below. The rock closely resembles the croppings of the Willard & McDonald mine, which has been worked with great success.

Amador.

MINING NOTES ALONG THE MOTHER LODE.—*Ledger*, Dec. 20: The South Spring Hill Co. has commenced sinking, with the intention to go 200 feet deeper and explore that portion of the claim adjacent to the shaft. A new shaft is to be sunk between the present shaft and the mill, which will greatly facilitate operations, by avoiding running the rock such a distance underground. It is reported that the company have purchased the Median mine which joins the South Spring Hill on the east. This makes three claims under one management, as the Talisman has been owned by them for years. Another ten stamps have been added to the mill, making 40 stamps in all. The Keystone mill is idle, but is expected to resume operations before long. The Gardner mill started up again last Monday with a full force of men engaged at the mine. The effect of the new developments in litigation concerning the Amador gold mine is a matter of general discussion around Jackson. One object of the suit by the New York parties is to stop the sale of the property under execution. Some of the claims are represented by mechanics' liens. It is thought that these at least will hold, no matter in whose favor the question of title is decided. However, the outlook is that the property will be tied up in the courts for years. The rich vein struck in the Plymouth Consolidated is said to have widened out. Another body of ore, equally rich, and of larger dimensions, has been discovered. The prospects are so encouraging that the mill will likely be started before long.

FROM VOLCANO.—The Volcano Tunnel Co. have received a new engine and are now erecting an additional derrick. Under the able management of Supt. J. Eckart, work is pushed vigorously, and everything is in readiness for the coming rains. The indications for a profitable run this season are bright, provided a sufficient amount of water is at their command. J. Largomasini, whose gravel claim is situated near town, commenced hydraulicing this week with fine prospects of a good clean-up. Mr. Christenson, owner of the French mine, intends to sojourn at the bay this winter, but will return in early spring. We hope that this genial gentleman on his return will commence active operations at his mine and infuse some new life into our town. Forty-nine Flat, about 4 miles north of town, has received some attention from mining men lately. Antone Reale, our newly-elected recorder, who is one of the owners of a claim in that locality intends to work it on a more extensive basis, having met with fair encouragement of late.

Calaveras.

MORE REMAINS.—*Chronicle*, Dec 20: Four more of the entombed miners in the Utica mine were discovered by the rescuing party last Monday and were buried the following day in Protestant cemetery at Altaville. They were followed to their last resting-place by a large number of the employes of the mine, and religious services were held at the cemetery by Rev. Goodsell of Murphys. Three bodies were identified as William Vincent, John Bray, John Segala, the fourth being beyond recognition. Four bodies are still in the mine, 16 being entombed at the time of the accident. It is now thought that the remaining bodies will soon be discovered.

Del Norte.

BEACH MINING.—*Record*, Dec. 18: Messrs. Lhote and Raymond, who have been staying in Crescent City for several weeks, received by the last steamer an engine and machine to work the black sand beach mines in this vicinity. They have secured the rights to work the ground and will have their machine in operation in the course of a week or ten days. The machine has been tried at Santa Cruz, where it proved a success, and they are confident it can be worked to advantage here. They represent a San Francisco company, and if the result is favorable, a revival of beach mining may be looked for in Del Norte county.

Nevada.

GENERAL MINING NEWS.—Grass Valley *Union*, Dec. 19: The west drift in the No. 2 level of the Coe mine is opening up finely, the ore being of good milling quality. The west drift on the No. 5 level has been started. Good-looking ore is beginning to show both in the east and west drifts of the Manhattan mine on the 280-foot level. The south drift on the No. 3, the lowest level of the Hartery mine, shows a strong vein of good ore. The mine is doing well, making a profit regularly over expenses. A large part of the machinery for the extraction works is now on the ground, to be put in place as fast as possible. The Idaho Co. will sink a shaft north of what has hitherto been considered the lode line. It is now a well-established opinion that the croppings indicate the true line of the Eureka-Idaho-Maryland lode. The tunnel at the Delhi is in 1075 feet, being for the last 45 feet of that distance on the ledge formation. At the St. Gothard, which is on a vein parallel with the Delhi and 600 feet to the east, the tunnel which is in 1500 feet last week tapped a five-foot ledge of fine-looking ore; 300 feet of backs can be obtained by this tunnel. At the Enterprise the 100-foot tunnel run to give air has struck the ledge 100 feet below the croppings, and it is a good 2½ feet in thickness.

Mono.

SHIPPING CONCENTRATES.—*Enterprise*, Dec. 20: A carload of concentrates from the Standard mine, Bodie, was shipped hence last Saturday. Superintendent Macy was also a passenger for tidewater. He is much pleased with the future prospects of Bodie.

Plumas.

BROWN'S HILL.—*Mercury*, Dec. 20: The mines in this vicinity are panning out rich, the Brown's Hill Mining Co. having struck dirt that pays $25 to the car. G. W. McMillan last evening picked up a nugget which weighed 5½ pounds—the largest piece ever found in the mine. Wm. Wheeler and W. W. McMillan, two Butte county boys, are partners in a rich claim here, and will soon be two of the wealthiest miners in Plumas county. The Perkins & Higgins mine has closed down for the winter. It is reported that they will work a three-shift crew next summer. The Phelan & Kittrick mine has also closed for the season after a successful run. Operations will soon be commenced on Cammel's Diggings. Stewart and Deburk expect to take out as much of the precious stuff as a mule can carry, in the spring. Jake Moore will have several quartz-mills grinding rock in his mine by spring. A. Ross, of Pinkard creek, is going into the mining business on a heavy scale and he has good prospects, too.

BIG NUGGET.—Greenville *Bulletin*, Dec. 19: At his mine on Rush creek on Sunday last, Chas. Hepler found in a sluice-box, a gold nugget weighing about $195. It was taken from what is called the Edman drift claim. Mr. Hepler and his associates own about a mile of the channel from which this nugget was taken.

San Diego.

THE OUTLOOK.—Julian *Sentinel*, Dec. 19: The mining outlook is brighter to-day, and more substantial work is being accomplished. There are more men employed, more capital invested, more inquiry concerning the camp and more bullion being taken out than at any period in the history of the district. Moreover, the movement of capital this way has only just begun. With the opening of spring will come a rush that will attract the attention of the entire coast. The Gold King Mining Company are rushing their ore down to their new mill, which is nearing completion. They will start the mill about the 1st of January, and another 10 stamps will add their products to the bullion now going out of the camp. We know of 20 more stamps that will soon be pounding away on rich ore.

Shasta.

MINING NEWS.—*Democrat*, Dec. 19: One of the oldest Comstock miners was here this week, and is now traveling and negotiating the purchase of mining property. He cheerfully expressed his opinion as to Shasta county mines. He says he believes the southern slope south of Mt. Shasta will produce, when developed, the best paying mines in Northern California. He expresses his surprise at the excellent prospect the veins have on the surface and that so few ledges are in course of development. The Keystone Company is still pegging away, sinking upon a 3½-foot ledge. Mr. White is taking out some good ore on the east end of the White Oak mine. Harry Paige has discovered a large ledge south of Shasta, on the Richardson road. Some of the ore assays $300 per ton and does not contain a color of free gold. The Gleaves mine, on the same ledge as Paige's, assays from $32 to $1137 per ton.

NOTES.—Shasta *Courier*, Dec. 20: The sale of a group of quartz mines on Dog Creek, near Delta, has given renewed encouragement to ledge-owners in that vicinity. Jos. E. Bell is opening out what promises to be a very rich mine a few miles west of town. Morris Mehon is superintending the work. James Sutherland is working a quartz ledge just west of town, and shipping ore to the Selby Smelting Works at Vallejo Junction.

Siskiyou.

FROM THE MINES.—Yreka *Journal*, Dec. 19: The blue gravel diggings of Lee, Lasb, Perlin & Kenyon, at Greenhorn creek, continue to attract much interest, and may be the forerunner of opening up the creek-bed and surrounding country on a more extensive scale, for reaching the deep underlying blue gravel not yet disturbed on account of the drainage required. The red cement pays good wages and the blue gravel is exceedingly rich, yielding from $10 to $20 per day to the hand. The blue gravel lead extends under a hill, and it is believed this hill is a slide from the high mountains beyond. Parties who have been investigating the course of the blue gravel area, think it extends all through this section between the sandstone formations in Shasta valley and the quartz vein and rock formations of the Humbug and Salmon ranges of mountains along the west side of Yreka and Scott valley, having been found at various points all the way from Jacksonville, Or., to the southern borders of Siskiyou, Trinity and Shasta counties. The Klamath river miners are making arrangements for extensive operations next season, having been unable to do as much successful mining this year as usual, on account of the destruction of the wagon-roads and mining apparatus by last winter's extraordinary floods. The Chinese Co., working the Bentz claim near Honolulu, has undoubtedly taken out considerable gold this season, parties estimating the amount at about $18,000, as the Chinese refuse to tell. The McConnell claim, at mouth of Humbug creek, has paid very well, but the expenses have been very great in rebuilding houses and dams washed away last winter. George Simmons, an energetic river miner, is now procuring a large quantity of lumber for the purpose of operating the old Kanaka claim next season, and the Centennial Co. is also preparing for a long run of successful work next summer. Carrick & Nichols are now sinking down on their rich quartz ledge at Spring gulch, about a mile north of Yreka, which is gradually widening and producing better average paying quartz than the surface croppings. They feel confident of having struck a permanent ledge, and will continue to pound out the rich specimens in a hand mortar, and store away the average quartz for hauling to the mill when sufficient is taken out for a good run of crushing. The Spencer mine at Humbug creek continues to yield good pay, and seems to give promise of being extensive. The quartz is hauled to McCook's mill at the forks for crushing.

NEVADA.

FROM THE MINES.—*Enterprise*, Dec. 18: The Cortez mining property is the most valuable, all things considered, in the State. While the mines are situated three-fourths of a mile in Eureka county, the mill, assay office, blacksmith shop, three large stables, store, and hotel are some 1400 feet in Lander county. It is conceded the monthly profits of the Cortez plant are in the neighborhood of $30,000, and everything is done on a cash basis. The smelter at the Pioche is handling 50 tons of ore daily, turning out five tons of bullion of 800 ounces of silver to the ton, the rest being lead. The gross returns are about $1500 per day. The mining outlook for next season in this section is good. This is independent of the passage of a free-coinage measure, which would make it still better. The Richmond Co. at Eureka, Nevada, recently put ten miners at work on day's pay to prospect during the winter for new ore bodies. There is believed to be some good ground in the mine. Some rich mining strikes have been made near Belmont recently. Some good silver-lead properties on White Pine mountain are for sale. The Eureka Con. will start up another furnace as soon as a full supply of coke is received.

Washoe District.

THE WEEK'S WORK ALONG THE COMSTOCK.—*Territorial Enterprise*, Dec. 20: The south drift from the Chollar incline on the 1200 level is out 637 feet, and the face is in fair-grade ore. This ore is believed to be the downward continuation of the ore being prospected on the 1130 level by the Potosi winze workings. The water level of the Crown Point incline before pumping began was 30 feet above the 1500 level. The water is now 110 feet below that point. But for the extensive timbering and repairs needed in the incline as progress is made, the water could be drained fully as fast again. The water is being drained in the Gold Hill mines from the Imperial on the north to the Alta on the south. The increase in the flow of water in the Sutro tunnel since pumping began is about 30 miners' inches. This is a rough estimate, as miners' inches of water is a very indefinite quantity. The following information has been gathered from the weekly letters of the superintendents:

ALTA.—Stopes yielding usual quality of ore and mill crushing about 315 tons of $18 rock, as per battery samples.

YELLOW JACKET.—Doing extensive prospecting work throughout the mine and milling about 60 tons of $18 ore daily, as per battery samples.

IMPERIAL.—West crosscut No. 2 on 1000 level is out 122 feet, having been advanced 30 feet; face in quartz having no value. This is the only prospect drift being run. Work on the upper levels confined to overhauling old stopes, where are finding some bunches and streaks of fair ore.

CROWN POINT.—Are extracting from the 1800 stope about 15 tons of ore per day that assays from $18 to $20 per ton.

BELCHER.—The 1400 west crosscut is out 29 feet, and the face is in quartz of low grade. Shipped to the Vivian mill during the past week 247 tons of ore, average battery assay of which was $18.52 a ton.

GOULD & CURRY.—200 level: Northwest drift has been extended 15 feet; total length, 135 feet. 400 level: West crosscut No. 1 has been cleaned out and repaired 390 feet; total distance 583 feet. The northwest drift has been cleaned out and repaired 231 feet. All work in the old stopes stopped for the present.

KENTUCK.—The week has been occupied in timbering and repairing the main shaft where it was found necessary. So far 85 feet of the south compartment have been completed in a substantial manner.

OVERMAN.—Extracted 383 tons of ore. Shipped to the Brunswick mill 384 tons 1500 pound of ore. Battery assays average $17.74.

ANDES.—During the past week north drift, 420 level, was extended 17 feet; formation, porphyry, clay and quartz. South drift, 420 level, was advanced 18 feet; formation, clay and porphyry.

SAVAGE.—We have hoisted 594 cars of ore from the 300, 400, 500, 600, 750, and 1300 levels; shipped to the Mexican mill 362½ tons; ore milled, 525 tons; average battery assay, $16.27 per ton. We have commenced sinking in the ore body from the track floor of the 1300 level. A winze started from this level is now down 17 feet in ore of good quality. We are doing the usual amount of prospecting, bulkheading and repairing on the several levels.

POTOSI.—East crosscut No. 2, 100 feet north of the winze, 1130 level, is out 85 feet, and is passing through stringers of ore. East crosscut No. 3, 150 feet north of the winze, 1130 level, is out 10 feet; face in porphyry. North lateral drift from Chollar incline 1200 level, is out 637 feet; face is in fair-grade ore.

ARIZONA.

MOJAVE COUNTY.—*Miner*, Dec. 20: A custom mill has been built at Todd Basin which will benefit local miners, and the mining outlook for the county was never better than now. The mining interests of Northwestern Arizona are specially prosperous. The *Miner* says: The sale of the Mayflower group of mines adjoining the Vekol, to the St. Louis syndicate of which Mr. R. J. Compton is president, is a future deal. It will lead to the development of what is generally considered to be an excellent piece of property.

COLORADO.

PITKIN COUNTY.—Aspen *Times*, Dec. 17: Nearly $100,000 had been expended on the Little Annie, Eureka and Juda, when Mr. Wheeler took up the financial fight and search for pay dirt. Nearly $30,000 has been produced, and the mine will now soon rank with the best. The people of Aspen should own all the stock of this mine.

THE GOOD THUNDER.—The bonanzas recently opened by the Good Thunder are now the wonders of Tourtelotte park. On the north lease, the bins, holding 600 tons, are piled full to the roof, although all of Holbrook's teams have been busy hauling the ore away for ten days. Manager Murphy declares that the ore bodies are the largest he ever saw anywhere. It is all pay and is shipped without sorting.

A FAMOUS SPECIMEN.—Cowenhoven & Brown have in their office a specimen of ore from the Aspen mine, which is one of the finest that ever came from that property. It weighs in the neighborhood of 150 pounds, and will assay between 4000 and 5000 ounces per ton, with perhaps 50 per cent of lead. The dirt that was washed off in cleaning the specimen assayed over 3000 ounces.

A BIG DEAL STOPPED.—It is not generally known, but it is a fact that when the London panic occurred it put an end to negotiations that would have resulted in the biggest mining deal ever known in Colorado. The negotiations were being conducted by Messrs. Hagerman & Davis, and had for their object the sale of a number of the most valuable Aspen mines to an English syndicate. The properties that were embraced in the proposed deal cover nearly all the lower part of Aspen mountain, and if the trade had gone through, some $13,000,000 would have changed hands in the transaction.

LOW PRICE OF LEAD.—Georgetown *Courier*, Dec. 20: The ore market is more complicated. It is probable that the smelters will quit buying lead ores for a time. The drop in the price of lead in the past 30 days is frightful. The only marketable material will be dry ores, and for this the miners can get but 90 per cent with an enormous smelting charge tacked on.

MINING PROGRESS.—Georgetown *Courier*, Dec. 20: An effort is being made to resurrect the Golden Smelting Works. Dan Doyle is pushing developments on the Claybourne with a very promising outlook. H. C. Cowles & Co. had a mill run this week from the Maud S. which returned $51 to the ton. The large Aspen mines will keep their men employed on development work during the panic in the ore market. In the 165-foot level west on the Monitor, a vein of yellow copper ore, 18 inches in thickness, has been opened up which will mill from $100 to $125 to the ton. J. Donaldson & Co. have discovered what is thought to be an extension of the Pennsylvania mine in Peru district. They have stripped a 14-inch vein of solid mineral at grass-roots. The Pueblo *Review* says there is some talk among the buyers of making the silver price 93 per cent instead of 95 per cent cent as heretofore, in view of the fact that only 95 per cent of the white metal is saved by a lead smelter. The shipment of ore from the Silver Glance mine to Pueblo brought better prices than was anticipated. The smelters pay 95 per cent of New York price, and the smelting charge on dry ores is $15 per ton.

IDAHO.

OWYHEE COUNTY.—*Avalanche*, Dec. 18: The mill and concentrators at Flint have now been running nearly a week and appear to be fulfilling all that was expected from them. The first ore run through assayed 17 ounces in silver. An assay of the concentrates shows their value to be $360 per ton. It is scarcely three weeks since Messrs. Longmaid & Co. purchased the Stormy Hill mine, but in that time they have put up a small hoisting works, have piled up a winter's supply of wood and mine timbers, got a boarding-house running and now have a double shift of men busy at work enlarging and retimbering the shaft. The Trade Dollar mine, of which we wrote flatteringly last week, still continues to merit all we said concerning it. It is reported that James Shaw has struck it rich in his Cumberland mine on War Eagle mountain. The mine lies parallel with and only about 100 feet east of the once famous Golden Chariot.

LOWER CALIFORNIA.

ALAMO.—*Californian*, Dec. 18: Not much noise is being made about Alamo, but it is generally conceded that more gold is being produced than at any time in its history. The encouraging aspect of every mine as depth increases has made the development much more rapid. The Princesa Company under Supt. Rodda is forging ahead and some of its properties are now invaluable. The Princesa mine is producing better rock, and at a greater depth, than ever. The Ulises, Indio, and others are being worked in good shape. The hoisting works from the Penelope will, it is said, soon be moved to the San David, which is one of the most promising of the Princesa Company's mines. Outside of the Princesa Company, the most important work is being done by the Aurora Company. Hoisting works are being put up and the new pump put in place, and the mill is receiving some additions and repairs. The shaft in the Aurora mine is steadily sinking, and the proprietors intend to keep on until they have a sufficient ore body assured above their heads to warrant a big mill, which will then be forthcoming. Matias Moreno and Julian Rodriguez followed up a ledge of gold ore which they found near Moreno's house in the Guadalupe valley, and were surprised and delighted to come upon an old shaft that had been abandoned, containing ore showing free gold in abundance. The ledge at the old shaft is about four feet wide and offers rich returns to the finders, who have denounced it and will commence work upon it.

MONTANA.

A GOOD YEAR. — *Inter-Mountain*, Dec. 18: Butte's production this year will be above $25,000,000, and the promise is fairly sure that in 1891 it will go a good deal above $30,000,000. Butte is the greatest mining camp on earth, and it will be several times greater before the next ten years.

SYNDICATE MINES RESUME.—A source of much satisfaction to many is to learn of the resumption of the Syndicate mines. The Mountain and the other three now employ about 1200 men in and around the properties that have for about two weeks been in a state of idleness.

THE BOSTON AND MONTANA.—There has been no reduction in the output at the Boston and Mon-

tana smelter the past week. The mines are in the same condition of affairs, and in all their underground workings they present the best showings of any mine or mines in the district.

THE ANACONDA MINE is employing about 400 miners underground, a force equal to that of eighteen months ago, and the production of ore is, if anything, greater than it was at that time.

THE ST. LAWRENCE is not employing as many men by 200 as the Anaconda, though a vast amount of work is being performed and a full share of ore comes from this mine.

MOUNTAIN VIEW COPPER.—There is no better showing in any copper mine on earth than that on the 1000 of the Mountain View.

NEW MEXICO.

GRANT COUNTY.—*Enterprise*, Dec. 17: Five more stamps are being added to the Key mill and will soon be dropping on ore. The main workings of the Key have now reached a depth of 600 feet, and the mine is in better shape to produce heavily than ever before. Favorable reports continue to come in from Cook's Peak district. It is to-day the heaviest producer in Grant county, and the greater the development the larger the ore bodies.

THE YEAR'S PRODUCT.—*Sentinel*, Dec. 16: In the output of gold, silver, copper and lead, Grant county leads all others in New Mexico. The total of all metals produced reaches the handsome figures of $1,426,903. She is followed by Sierra with $976,686; Santa Fe, $727,654; Socorro, $366,626; Lincoln, $218,459; Dona Ana, $158,356; Colfax, $117,500; Mora, $23,200; Bernalillo, $8500; a total of $4,023,883 for the year.

MINE DEVELOPMENT.—Silver City *Enterprise*, Dec. 19: Mining transactions of importance are becoming an every-day business in the Mogollons. Among the latest reported are the transfer of one-third interest in the Little Fanny mine to the Mogollon Consolidated Mining Company, Captain Frank Vingo receiving therefor one-third interest in the Mogollon Consolidated Mining Company's mill and $10,000 cash. The mill is one of the best constructed reduction plants in the Territory, and cost upward of $70,000 to build. With such a mine as the Little Fanny to produce the ore, the company ought to be on a good dividend-paying basis, and Captain Vingo is in a fair way to become a bonanza king. Another transfer during the past week was the bonding of the Mountain Key claim on the Queen lode, owned by Mader & Buhlman. The mine is bonded to New York parties for the sum of $30,000, a large portion of which was paid cash down. This is another instance of miners abandoning claims without thoroughly prospecting them. This claim was first located by Jno. A. Miller in '79 or '80, and abandoned in '83. It was then relocated by Jo E. Sheridan, who held it for two years, and abandoned it in '85 or '86; relocated by Wm. Burns, one of the pioneers of the camp and a thorough mining man, but he also failed to discover its value, and abandoned it, when it was relocated by Geo. Rowe and others, and again abandoned, when Mader & Buhlman relocated it and discovered several rich ore chutes covering nearly one-half of the whole 1500 feet, and placing it in the front rank as a producer. The New York parties who have now taken hold of it propose to develop it thoroughly and erect reduction works at the mine.

OREGON.

BLUE GRAVEL.—Asbland *Tidings*, Dec. 19: Wm. Huntley Hampton, the Portland assayer and mineralogist, was in town several days last week on his return home from a visit of several days in the Blue Gravel country over about Hornbrook. He has unbounded faith in the eventual development of a great mining industry in drifting and working the great beds of blue gravel which have been proven to exist and to carry gold. How rich the gravel is the future will have to determine, but it is said that none of the people who are working in it have reached a point where it is to be expected the rich part of the ancient water-bed lies. The bedrock is pitching wherever exposed under the gravel, and the distance from the shore-line is not far enough in any place yet worked to lead the miners to expect the returns that are looked for at the line of gold deposit from sources that have fed the gravel deposits; at least that is the case at all the mines yet opened unless it be at the one on Greenborn, near Yreka, where the miners are drifting 80 feet beneath the surface and are reported to be taking out $25 per day to the man. Mr. Hampton represents parties who have located some 300 acres or more of the land supposed to overlie the gravel, and while over there last week he let the contract for the sinking of 50 feet of vertical shaft over one of the claims. This 50 feet is not expected to reach the gravel, and is but the beginning of a shaft which may be 200 feet before the gravel-bed is struck, Mr. Hampton says.

SOUTH DAKOTA.

HOMESTAKE CO.—Deadwood *Pioneer*, Dec. 18: A rumor has been going the rounds ever since the Caledonia shut down, that the mine had been sold to the Homestake Company and would be worked by them. Yesterday this rumor was authenticated by one in a position to know. He says that the recent purchase of the Pierce mine by Tom Bell, who is a director of the Homestake Company, was in the interest of that company, and that the two mines will form a portion of the great Homestake system.

UTAH.

VARIOUS MINING ITEMS.—*Tribune*, Dec. 18: Deep creek is still the absorbing talk with mining men throughout the Territory. A company has been organized in Salt Lake to work the gold placers in Mill Creek canyon. Hydraulics will be used. An extensive deposit of ozocerite, or mineral wax, has recently been discovered in Hurricane Valley, about 25 miles south of Rio Virgin, in Southern Utah. The Ogden *Standard* claims that there are a number of rich lodes of silver lead ore in the Wasatch range, near that city. There are said to be 100 men in Tintic awaiting Jan. 1, 1891, with a great deal of eagerness and anxiety, that being the day fixed on which they expect to make a gun play and rob some poor prospector of his mining claim. Henry Ressor, a reputable miner from Marysvale, came into Beaver yesterday and reported that a wonderful gold mine had just been discovered at the head of Bullion canyon. About six feet of croppings has been removed, all of which contains gold sprinkled through it in size and shape of a pea. A sample of the rock was taken to Tom Ferguson's assayer, which assayed $60,000 to the ton. The vein has every appearance of permanency.

NIAGARA ORE PRODUCT.—The Niagara Co. has two four-horse teams hauling 30 tons of ore per day from the Live Pine mine to the railway depot, and the mine is in shape to keep this up for a long time. The Stewart No. 2 has its mill running on gold ore, and they propose to keep the ten stamps, two pans and one settler going right along. They also have a barrel or Frieberg amalgamator running. The mine is looking spendid. One of the evidences of the growth of mining in Bingham is found in the fact that since last June 160 new locations have been recorded. Dividend No. 7, of $15,000, for December, has been declared by the Centennial-Eureka. A rich strike in the Golden Chain, close to Mammoth, is reported. J. C. Carson has a lease and bond on the ground and will, no doubt, now that he has struck it rich, take up the bond, which is for $30,000.

MARKET REPORTS.

Local Markets.

SAN FRANCISCO, Dec. 25, 1890.

The close of this year is no exception to its predecessors—dullness reigns supreme in all lines. The local money market is shaping itself for general ease. Taxes are paid and the last collection day of the year falls on next Monday, which will be followed the ensuing Monday by disbursements for interest, dividends and payments by the State, counties and cities. These disbursements will extend well into the month. There is a growing feeling of confidence. Long-term loans are more readily obtained, while gilt-edged paper is being sought for by some moneyed men. Eastern advices are confirmatory of returning ease and a gradual shading off in the rate of interest.

MEXICAN DOLLARS—There is a slight demand at 82@83 cts. The next steamer for China sails on January 10th.

SILVER—In the absence of Mint buying, quotations are nominal. The Mint will be in the market on January 2d. Eastern advices are conflicting, but from a careful study of the field we are drawn to the opinion that no free-coinage bill will be passed by this Congress. Partisan legislation, not the country's good, appears to be the aim of the dominant party, and in carrying out their pet political measures, financial and other business legislation will be held in the background. Again the moneyed men, unscrupulous speculators and Shylocks, who skin the many forced to seek accommodations, are opposed to the free-coinage of silver. They recognize the fact that when the latter is secured they cannot carry on their games with the same high hand they have done for years past. To defeat silver legislation, they would undoubtedly spend considerable money to influence Congress. Jay Gould lately sounded the key-note for them. A pool is said to be buying all the silver bullion it can get, in the expectation of selling out at a good profit on the cry of a free-coinage bill being passed by this Congress.

QUICKSILVER—Receipts the past week aggregate 162 flasks and 550 flasks by overland railroad. The market is quiet, rendering quotations nominal.

LIME—Receipts the past week aggregate 4286 bbls, and exports by sea 1350 bbls to Honolulu. The market is quiet, but not dull as it was in December, 1889.

BORAX—Receipts the past week aggregate 220 ctls. The market is quiet. Some buyers claim that commissions are obtainable, but the companies report unchanged quotations.

ANTIMONY—The market is a shade lower. Exports by sea the past week aggregate 11,000 lbs. to New York.

LEAD—The market, after easing off for some time, appears to have touched bottom. At the East a better demand is expected to set in soon after the holidays. European advices report an improving market.

TIN—Imports the past weak aggregate 1770 pigs from Sydney and 5720 boxes of plate from Liverpool. Pig is lower and weak at the decline. Plate continues firm. Eastern advices report an advance for pig for January-February delivery, due to light shipments into England from the Straits, causing an advance in the English markets. London cables report a light demand for plate, but more strength for pig.

COPPER—The market continues on the down grade. London cables to the *Iron Age* under date of Dec. 18th, report as follows: Prices for copper dropped early in the week, owing to pressure to sell by holders and manipulation by the bear interest arising from the unfavorable condition of other markets, and rumors that larger supplies are likely to come from America at probably lower prices. Consumers are still cautious buyers, but speculation has improved somewhat the past few days. English stock of copper has decreased 1410 tons, and the European visible supply 1609 tons during the past fortnight.

IRON—Imports the past week aggregate 450 tons from England. The market is barely steady. Slight concessions are said to be obtainable.

COKE—Imports the past week aggregate 395 tons. The market is steady.

COAL—Imports the past week aggregate as follows: Swansea, 2249 tons; Seattle, 3250; Coos Bay, 600; Liverpool, 2379; Tacoma, 2400; Hull, 1367; Nanaimo, 3319; total, 15,564 tons. The market is easing off for Coast coals, which will be followed next month by foreign coals. Importations of English are coming to hand more freely, while Australian will begin to arrive toward the last of January. Coal vessels on berth at Australian ports are receiving quick dispatch, while the list of vessels loading and to load, steadily increases. At the present writing, everything points to an unusually large wheat crop in this State, which means good outward freights, and to get advantage of it, coal vessels will head this way. The acreage seeded to wheat is the largest up to the last of December, on record.

MINING SHAREHOLDERS' DIRECTORY.

COMPILED EVERY THURSDAY FROM ADVERTISEMENTS IN THE MINING AND SCIENTIFIC PRESS AND OTHER S. F. JOURNALS

ASSESSMENTS.

COMPANY.	LOCATION.	NO.	AM'T. LEVIED.	DELIN'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Atlantic Con M Co	Nevada	7	25	Nov 19	Dec 29	Jan 19	D M Kent	330 Pine St
Confidence Silver M Co	Nevada	17	15	Nov 17	Dec 22	Jan 12	A S Groth	414 California St
Con New York M Co	Nevada	4	15	Nov 12	Dec 17	Jan 6	C E Elliott	309 Montgomery St
Con Imperial M Co	Nevada	30	5	Dec 13	Jan 3	Feb 9	D L McCoy	331 Pine St
Con St Gothard M Co	California	2	10	Dec 9	Jan 15	Feb 7	T Wetzel	320 Sansome St
Contra Estaca Con Mex M Co	Mexico	1	50	Dec 15	Feb 14	Apr 4	George Gale	309 Montgomery St
Crown Point M Co	Nevada	53	50	Dec 3	Jan 7	Jan 28	James Newlands	331 Pine St
Exchequer M Co	Nevada	30	25	Dec 9	Jan 15	Feb 5	C E Elliott	309 Montgomery St
Gray Eagle M Co	California	21	3	Dec 20	Jan 26	Feb 16	A W Barrows	303 California St
Head Centre & Tranquility M Co	Ariz	11	5	Dec 11	Jan 16	Feb 9	J W Pew	310 Pine St
Inyo Marble Co	California	11	10	Dec 16	Jan 30	Feb 20	G W Luce	132 California St
Leigh Gravel M Co	California	2	5	Nov 22	Jan 3	Jan 24	E F Fall	320 Sansome St
Morgan M Co	California	11	10	Oct 30	Dec 6	Dec 29	U C Gresse	230 Montgomery St
Northwestern G & S M Co	Br Columbia	1	5	Nov 12	Dec 15	Jan 15	E Bouclus	438 California St
Potosi M Co	Nevada	35	50	Dec 16	Jan 20	Feb 10	C E Elliott	309 Montgomery St
Riverside M & M Co		1	10	Dec 11	Jan 12	Feb 2	J Stadtfeld	309 Montgomery St
Telrakoff M Co	California	6	1	Dec 6	Jan 8	Feb 9	W J Gurnett	308 Pine St
Utah Con M Co	Nevada	11	25	Dec 9	Jan 19	Feb 9	A H Fish	Nevada Block

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY	OFFICE IN S. F	MEETING	DATE
Bullion M Co	Nevada	R R Grayson	327 Pine St	Annual	Jan 3

LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Candelaria Cons M Co	New Mexico	G Gale	309 Montgomery St	25	Dec 3
Commonwealth M Co	Nevada	R R Grayson	331 Pine St	20	Nov 20
Eureka Cons M Co	Nevada	R P Bush	306 Pine St	25	Aug 6
Pacific Borax Salt & Soda Co	California	A H Clough	230 Montgomery St	1 00	Dec 10

Mining Share Market.

Mining shares the past week were more active, with attractive fluctuations, particularly in Potosi and Bullion. The moves in these two stocks indicate they are well in band and that the stock-gambling pool is trying to draw in buyers in order to collect the assessment on Potosi and levy one one Bullion at the annual meeting to be held next month, to be followed by assessments by other companies. So far as we are able to learn, large outside dealers are afraid to buy, preferring to sell short on every little spurt.

While the writer has no confidence that the stock-gambling pool will send prices up very high, yet it is safe to affirm that with money easier next month (on and after the 10th), a more vigorous effort will be made to unload at a profit. In order to sell, the moves will probably be attractive, and even a showing of ore may be resorted to. That rich ore, but not to any extent, can be shown up at any time is not denied by the well informed; but to the ring it pays better to mill the ore, peculiar to the Comstock district, by reducing assays and bringing the cost up to cover the value of the bullion turned out. This assertion is based on a qualification, provided the pool has no surplus stock to market at a profit, but if it has more shares than desirable, then some one of the mines is made to do service by paying dividends until the stock is unloaded. Con. Virginia paid dividends until the stock of that and adjoining mine was peddled out. Confidence was made to do service in like manner. After peddling out stocks, nothing has been left undone to get them back at low prices. In this they have been successful, and it is only a question of a short time—one or more months, perhaps less—when a decided up move must be made to again sell out at a good profit. What the manipulation will be in the meantime, we cannot say, but persons who have stock *paid for* can and should stand a decline, well knowing that higher prices will come, enabling them to sell out at a profit. In operating in stocks, the most successful in the long run are those who pay cash (no margin), buy after a severe depression, and hold until the market advances to afford a good profit. It is those who want everything that get left.

The decline in the Comstock shares the past six months averages about 70 per cent, including paid assessments on some.

The points are out for another decline in the Comstocks, after which the stock-gambling pool will start the deal. Many usually well-informed persons are waiting for the lower prices. Stocks selling below $2.50, $1.50 and $1 a share will not go down much, but the higher priced will fall off the most.

J. H. Tingman, vice-president of the Mining Stock Association, has a very savage article in the New York *Engineering and Mining Journal* of Dec. 13th, which that paper indorses. If Mr. Tingman's assertions are wrong, why do not the officials of the Comstock mines prosecute him for criminal libel? This is the best way to clear themselves of such criminal charges.

Coal and Coke.

SPOT FROM YARD—PER TON.		TO LOAD—PER TON.	
Wellington	$12 00	Australian	$ 7 75@— —
Greta	14 00	Liverpool St'm.	8 50@— —
Carbon Hill	9 00	Scotch Splint.	8 50@ 9 00
Nanaimo	11 00	Cardiff	8 50@— —
Gilmsn	10 00	Lehigh Lump.	16 50@17 00
Seattle	10 00	Cumberland bk	13 50@— —
Coos Bay	7 00	Egg, hard	15 00@— —
Cannel	14 00		
Egg, hard	16 00	**Coke—English.**	
Cumberland, in sacks	19 50		
do, bulk	18 00	To load	$12 00@13 00
Wallsend	13 00@14 00	Spot, in bulk	16 00@18 00

Eastern Metal Markets.

By Telegraph

NEW YORK, December 24.—The following are the closing prices the past week:

	Silver in London.	Silver in New York.	Copper.	Lead.	Tin.
Thursday	49⅛	1 07¼	$15 00	4 12½	$20 30
Friday	49⅛	1 06	15 00	4 12½	20 80
Saturday	49⅝	1 04	15 00	4 12½	20 80
Monday	47½	1 02⅝	15 00	4 12½	20 50
Tuesday	47½	1 01½	14 75	4 12½	20 50
Wednesday	....	....	....	....	....

Borax is barely steady. Lead has a firmer tone. Tin appears to be gaining in strength. Copper is weak and feverish under selling pressure. Arizona is 14, common casting brands 13.

Successful Patent Solicitors.

As Dewey & Co. have been in the patent soliciting business on this Coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific Coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this Coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That this is understood and appreciated, is evidenced by the number of patents issued through their SCIENTIFIC PRESS Patent Agency (S. F.) from week to week and year to year.

San Francisco Metal Market.

WHOLESALE.

WEDNESDAY, December 24, 1890.

ANTIMONY	—	@ 20
BORAX—Refined, in carload lots	8	@ —
" " "	8	@ —
Concentrated " "	7¼	@ —
All grades jobbing at an advance.		
COPPER—		
Bolt	23	@ —
Sheathing	23	@ —
Ingot, jobbing	18	@ —
do, wholesale	16	@ —
Fire Box Sheets	23	@ 25
LEAD—Pig	5	@ —
Bar	6	@ 6½
Sheet	7	@ —
Pipe	6	@@ —
Shot, discount 10% on 500 lbs	Drop, ₰ bag	1 80	@ —
Buck, ₰ bag		2 10	@ —
Chilled, do		2 20	@ —
QUICKSILVER—By the flask		52 50	@53 50
Flasks, new		—	@ —
Flasks, old		4	@ 55
CHROME IRON ORE, ₰ ton		10	00 @ —
STEEL—English, lb		16	@ 20
Canton tool		9	@ 9
Black Diamond tool		9	@ 9
Pick and Hammer		8	@ 10
Machinery		4	@ 5
Toe Calk		4½	@ —
TINPLATE—B. V., steel grade, 14x20, to arrive		6 37½	@ 6 50
B. V., steel grade, 14x20, spot		6 37½	@ —
Charcoal, 14x20		6 50	@ —
do roofing, 14x20		6 00	@ —
do, do, 20x28		13 00	@ —
Pig tin, spot, ₰ lb., nominal		22	@ 22½
IRON—Bar, base		3	@ 3½
Norway, base		4½	@ 5¼
		Spot.	To Load.
IRON—Glengarnock ton		34 00	@— —
Eglinton, ton		34 00	@— —
American Soft, No. 1, ton		— —	@32 00
Oregon Pig, ton		—	@34 00
Puget Sound		31 00	@— —
Bar Iron (base price) ₰ lb		— @—	— @ —
Clay Lane White		—	@28 00
Shotts, No. 1		34 00	@35 00
Langloan		34 00	@— —
Thorncliffe		34 00	@— —
Gartsherrie		34 00	@— —
Barrow		34 00	@— —
Thomas		33 00	@— —
Cargoffeet		30 00	@— —

NEW DISCOVERIES.—There cannot be a more indefinite speculation than that as to the era in which the mineral resources of the world will be exhausted, for discoveries of "enormous deposite" of mineral are of almost every-day occurrence, each one apparently outvying the other in importance. Not only have discoveries of gold been made in Canada that are said to be likely to have more brilliant results than even those of Mexico and California, but silver and lead have been found in great abundance in Russia. These deposits exist at the source of the River Konhanc, and the prospecting which has taken place since March shows that the mineral is of considerable richness. More than twenty veins of silver and lead have been discovered, some of them bearing evidence of having been worked centuries ago. These deposits are favorably situated for their exploitation, for not only is there an abundant and rapid current of water in the River Konbsnc, but the railway is in close proximity, and the roads for that part of the empire are good. These discoveries of mineral deposits in Russia are evidently the outcome of the steps that are being taken to develop the resources of the country.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

H. KELLEY—Wodoc and Laseen Cos.
GEO. WILSON—Sacramento Co.
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J. C. HOAG—San Francisco.
M. E. DOLAN—San Francisco.
SAMUEL CLIFF—Creston, Cal.
J. H. CROSSMAN—San Bernardino Co.
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Dewey's patent elastic binder, for periodicals, music and other printed sheets, is the handiest, best and cheapest of all economical and practical file binders. Newspapers are quickly placed in it and held neatly, as in a cloth-bound book. It is durable and so simple a child can use it. Price, size of Mining and Scientific Press, Rural Press, Watchman, Fraternal Record, Masonic Record, Harper's Weekly, and Scientific American, 75 cents; postage, 10 cents. Postpaid to subscribers of this paper, 50 cents. Send for illustrated circular. Agents wanted.

MECHANICAL PROGRESS

Possibilities of Aluminium.

At the late meetings of the American Institute of Mining Engineers held in New York, one of the chief matters under consideration was the production and possibilities of aluminium, that wonderful metal which promises in the near future to be of vast importance to civilization and the human race everywhere.

At this meeting, and from college professors and mere experimentalists, there were present men whose great interest in metal is to make it of use to them in their business pursuits. Alfred E. Hunt, President of the Pittsburg Commercial Company, which through a new electrical process has greatly reduced the cost of producing the metal, and is prepared to supply it in large quantities, read a paper on "The Properties of Commercially Pure Aluminium." Professor Eggleston of Columbia College gave the result of some experiments he had made, and Professor William P. Blake and several other scientists made statements as to the properties and uses of the metal.

Stripping the subject of technicalities, it appears, according to a report of the meeting which we find in the N. Y. *Standard*, that aluminium, which is as strong as iron, and the best of it is as strong as steel, is only one-third as heavy as iron. It has a bright silver color, and is susceptible of a high polish. It is noncorrodible, is both malleable and ductile to a high degree, and is almost as good a conductor of electricity as copper. It readily unites with other metals, and as an alloy reduces the melting point of steel, a very important thing, and it frees both iron and steel castings from the bubbles or "blows." Silver and copper it hardens. Aluminium's chief use just now is in being mixed with bronze, producing what is known as aluminium-bronze, used in the highest grades of the arts. Among the exhibits of the metal before the institute were rolls of ribbon-like foil, some of it so thin that it could be blown away with a breath. Then there were all sorts of ingots and castings; cups and boxes drawn out of flat pieces; tubs, coils, medallions, pots, saucepans and frying-pans. With regard to the latter, Professor Eggleston said that while recently making an investigation for the New York Board of Health, he had made some experiments with the aluminum cooking utensils, and found that they were not attacked by organic acids, thus making impossible that slow but deadly process of lead or other metal poisoning known under that vague and general name of "malaria." As vinegar is an organic acid, the danger of using ordinary metal utensils is obvious.

Though present in all clay deposits, the difficulty of extracting it has hitherto made aluminium a commercially dear metal. It is not such a long time ago since its price exceeded that of silver, which is $12 a pound. Discovery after discovery simplifying the process of production has steadily brought the price down, until now aluminium is sold for about the same as nickel. There are perhaps a thousand men busy in their laboratories in various parts of the world seeking for some process by which to make the metal cheap and abundant. When they shall have found it, who can calculate the change there will be in the construction of railroads and steamships, the building of houses and bridges, and the making of thousands of things where iron and steel are now used? Take the bicycle for instance. An average "safety" machine weighs between fifty and fifty-five pounds, and the very lightest machine thirty pounds. Imagine machines of the same strength that shall weigh but eighteen and ten pounds respectively! But more important than all these, aluminium seems to have brought aerial navigation a long stride nearer, and who shall say how soon in this aluminium-electrical-single-tax age we shall be sailing the air in ships?

The very latest report of the progress made in cheapening the production of aluminium was given in a telegram of December 16th from New York, which said that a member of the bar in Columbia, S. C., has discovered a process by which aluminium can be produced from kaolin at a cost far below anything heretofore announced. While this statement must be received *cum grano salis*, there can be no doubt but that the progress of cheapening this product will continue to go on until it can be placed in fair competition with any other of the useful metals, especially when its lightness and other superior qualities are taken into account. It is more than likely that aluminium is in reality the coming metal.

Wear of Metal, as Influenced by Its Chemical and Physical Properties.

1. That metal which will suffer the most distortion without rupture will wear best. This quality of metal is usually measured or expressed in figures by the well-known physical data "elongation" or stretch before rupture in the common physical test.

2. The first variable being obtained in satisfactory amount, an increase in tensile strength will add to the wearing-power of the metal. The diminution of tensile strength, which is characterized by the better wearing of metals, according to our data, is not, if we are correct, a desirable quality. It is a concomitant of most metal that as it increases in its power of elongation, or stretch, before rupture, it diminishes in tensile strength. If, on the other hand, a new metal could be found, which, with any given elongation, was characterized by a higher tensile strength than some old and well-known metal with the same elongation, the new metal would, if the theory is correct, wear better than the old one. Wear, as we understand it, is the tearing off of minute particles, and if in one case it requires more force to tear off the particles than in another, the wear in that case will be slower. We have, we think, a little experimental data which point in this direction. The wear of bearings per thousand miles is about three times as fast as the wear of axles; in other words, as has already been stated, the standard phosphor-bronze bearing metal loses about a pound for each 25,000 miles that the bearing moves. The axle under it loses about a pound for each 75,000 miles, but the metal of the axle is from two to three times as strong per square inch, and its elongation is also somewhat higher than the bearing metal alloy.

3. The third variable which enters into wear, as we look at it, is what may perhaps be termed the "granular structure of the metal." This may, perhaps, best be illustrated by saying that, of two metals which have the same tensile strength and the same elongation, the one which is finer in granular structure will wear the slower.—*C. H. Dudley.*

Mountains of Steel.

Nearly four and a half million tons of crude steel were turned out in the United States during the year ending June 30, 1890. The amount produced during the census year of 1880 was a little short of one and one-quarter millions—showing an increase from 1880 to 1890 of 289 per cent. The principal increase was in Bessemer steel—from 985,208 tons in 1880 to 3,788,572 tons in 1890. The product of open-hearth steel was advanced during the same decade from 84,302 tons to 504,351 tons. In 1880 there were but 11 Bessemer steel plants in the United States, while now there are 53.

Steel Rails Not the Chief Cause of this Great Increase.

One of the most interesting things in connection with the large increase in the steel industry is the fact that the steel-rail industry is not increasing. The increase in the number of establishments producing Bessemer steel, according to the census report, has been the result almost entirely of the demand for steel in forms other than rails. All the 11 Bessemer steel plants that were completed in 1880 had been built to manufacture steel for rails, many of them being added to previously existing iron-rail mills. Of the 53 Bessemer steel plants at the close of the census year 1890, only 14 made steel rails during that year, and of the total quantity of rails produced, over 90 per cent was made by ten of these works. Thus, while the production of steel rails has nearly trebled in amounts since 1880, the number of establishments engaged in their manufacture has shown but little change in the ten years, although many of these works have greatly increased in size and efficiency. The competition in the manufacture of Bessemer steel rails has compelled many of the rail-mills to convert a large part of the steel produced by them into forms other than rails, the production of rails to any considerable extent at the present time being possible only in works favorably located for the supply of cheap raw materials and operated under the latest and most improved methods of manufacture.

Open Hearth and Crucible Steel.

The number of plants for the manufacture of open-hearth steel has increased from 25 in 1883 to 58 in 1890, and the production has increased during the same period from 84,302 tons to 504,351 tons. The number of crucible steel plants has increased from 36 to 47 during the decade. Pennsylvania made 64,235 tons of the total for 1890, and New Jersey stands next with 8343 tons.

IRON AND BRICK CHIMNEYS.—According to Prof. H. B. Gale, there is but little difference in the matter of draught between an iron and a brick chimney. There is more radiation from the iron stack, but this is offset by the greater frictional resistance and liability to leak in the brick stack. It is also found, as appears from those investigations, that the amount of difference between the draught from a round and a square chimney of the same light and sectional area is only 2 per cent. It is really much cheaper to build a square chimney.

SKILLFUL IRON ROLLING.—The Otis Steel Co. of Cleveland, Ohio, which has the largest plate mill in the world, recently rolled a 20-inch ingot of 8500 pounds down to three-quarter inch plate with one heat. Some of the members of the British Iron and Steel Institute, who visited these works during their tour of inspection in this country, were surprised at seeing plates rolled direct from the ingots without being hammered or otherwise prepared.

THE ELECTRIC DRILL.—The use of the electric drill in shipyards and construction works is becoming quite common, and it is shown that holes can be drilled in half an hour by the use of the electric drill that would require two men half a day to finish by the usual process.

SCIENTIFIC PROGRESS.

Experiments on Fire-Damp Mixtures.

A commission on colliery explosions, appointed by the French Board of Trade, has published a report on a series of experiments made by Messrs. Mallard, Le Chatelier and Chesneau, mining inspectors and engineers, upon the effect of sparks produced by miners' picks striking hard rocks upon mixtures of air and fire-damp. For this purpose were used mixtures of pure formene and air, and of these mixed with ordinary illuminating gas, which were made by passing the gases through multiple Bunsen burners into a wooden box, placed against granite and porphyry blocks, so disposed that by striking them with a pick the sparks fell into the box. Mixtures of illuminating gas and air were easily exploded by the sparks whenever they were large enough to remain incandescent during an appreciable time, a result obtained with nearly every blow. The sparks are formed of metallic particles burning strongly and forming globules of magnetic oxide. With mixtures of formene and air no inflammation could be obtained, although more than a hundred experiments were made under conditions in which a mixture of illuminating gas and air would certainly have been ignited. This difference is probably due to the inflammation of formene requiring a much longer time than that of illuminating gas, and the sparks becoming cold before it can be effected. Further experiments were made with mixtures of formene, illuminating gas and air; when the mixture contained equal quantities of two gases, explosions were sometimes obtained, but with mixtures containing .75 per cent of formene and 25 of illuminating gas, no explosions took place. As the best analyses of natural fire-damp show it to be composed of pure formene with only 3 to 4 per cent of other gases, the commission concludes that ignition of fire-damp in collieries cannot be produced by sparks from miners' picks. The picks used were both steel and more or less steely iron; but besides these, picks of steel, containing 13 per cent manganese and aluminum bronze, with eight per cent aluminum and 2 per cent silicum, were tested. The former give off hotter and larger sparks than iron picks, and ignite explosible mixtures still more easily, while on the other hand the aluminum bronze picks, whose hardness nearly equals iron, do not produce sparks and could not be made to ignite any of the mixtures. This is rather important, as, although the ordinary fire-damp may consist chiefly of formene, there is no certainty that no other gases may be inclosed in the coal and set free at times; and if bronze picks are absolutely safe they should, by preference, be used. By suitably mixing the alloy or treating it in forging, no doubt sufficient hardness for coal-mining purposes could be produced.—*Iron and Coal Trades Review.*

Reckoning Time.

A correspondent of the New York *Evening Telegram* tells its readers how the time is reckoned at the observatory in Washington, as follows:

The observatory does not reckon its time by the sun, but by the so-called "fixed" stars, which are so far off that their position with relation to the earth does not change appreciably within a few months or years. Star time is the only true time, therefore. The operator looks through a big telescope and watches for a given star that he knows to cross the plane of the meridian. As it crosses he records what moment it does so, as shown by a star time clock with a 24-hour dial. Then he consults a printed table that shows him at just what number of hours, minutes and seconds the star in question must actually have crossed the meridian plane.

The table is right, and by as much as the star-time clock differs from it, the latter is wrong. No attempt is made to set the star clock right, allowance being simply made in subsequent calculations for the error thus discovered, which amounts only to a fraction of a second in some days. Next the corrected time, as taken from the star clock, is reduced to sun time, which requires some figuring, inasmuch as the star year is one day longer than the sun year. A sun time or "standard" time clock stands close by, and the amount that this varies from the truth having been ascertained, allowance is made for the error in sending the noon stroke all over the country.

Regulating Chronometers.

At the observatory all the chronometers made for the navy are tested and regulated before they are sent out on vessels, each of which is supplied with three first-class chronometers, as well as one that is half used up, called a "hack," for carrying about and for rough service generally. It takes 21 weeks of testing to properly regulate and prove a chronometer, and part of the trial consists in subjecting the instrument to the action of cold in an ice-box, and to heat communicated through steam pipes. Each chronometer, when given out, is accompanied by a chart telling just how it will vary under certain temperatures.

ELECTRICAL SCIENCE. — The *Chautauquan* says: The attention of the electrical world has been centered upon electrical business more than electrical research. The progress made has been chiefly in the construction of reasonable or "working" theories to explain the phenomena of electricity. Among these is the theory of electrical transmission along a wire. We must now think of an electric wire as the core or center of disturbances extending all around the outside of the wire. We must not regard electricity as a "current" in the wire. It seems to be of no consequence what is going on in the wire, as all the energy is displayed on the outside, and the wire is probably affected only "skin deep."

Iron-Making in its Picturesque Aspect.

"It is strange," says the *Academy*, "that the rich material that lies ready to the eyes and hands of artists in our great modern iron works has not been more often seized upon for the making of pictures. Every one who has seen the processes of smelting and forging iron cannot fail to have been struck with the many picturesque effects that they yield—effects such as Rembrandt delighted in—of glowing light in surrounding darkness, of mystic beams and strange shadows casting a spell of beauty upon the most commonplace objects. A painting by our rarely seen native painter Wright of Derby was exhibited two or three years ago at the Old Masters' Exhibition at the Royal Academy, which represented the forging of a piece of iron with considerable skill and very fine effect; but, excepting this, we do not remember to have seen any work by an English artist dealing with this subject.

"A German artist, however, has recently recognized its capabilities. In a great picture, called the 'Cyclop's Workshop,' Adolf Menzel has represented the interior of a large iron foundry, with its giant steam-hammer, its blast and puddling furnaces, and its huge cylinders that roll out glowing masses of iron of many hundred-weight as if they were soft paste. One of these glowing masses forms the center around which the interest of Menzel's picture moves. It has passed through the first rollers, and is being taken up with great tongs by the foremost workmen in order to be passed on to the second, a proceeding that involves a prodigious exertion of strength. Other workmen are employed in different processes; some direct the machinery; one in the foreground wheels away a newly forged cylinder on a barrow; others are undergoing a very necessary process of purification and shirt-changing; while others again are seen in a group in the dark background, already beginning their mid-day meal. In the background of all is dimly visible the iron and steam monster that supplies the motive force for all this wonderful work.

"It will be acknowledged that here are splendid materials for a picture, only it wants a Rembrandt at least to deal with them. Herr Menzel is not a Rembrandt, but, according to the Berlin *Post*, from which this description of his picture is taken, he has produced a powerful, realistic work. He has worked for three years, it is said, on this one picture."

These comments will recall to American readers Mr. Wier's picture of "Forging the Shaft," which made its mark at the academy several years ago.

THE TRANS-SAHARAN RAILWAY, from Algiers to Timbuctoo, is said to present no insurmountable engineering problems; in fact, to be less difficult than the construction of our own transcontinental lines. The real difficulty will lie in dealing with the wild tribes of the desert, who control all the routes from Algiers to the Soudan; who are nomads whose only source of revenue is the tribute paid by caravans. The French propose to give them employment; promote village life by sinking wells, etc. But they are so wild that it is difficult to even negotiate with them. With a railway to the Soudan, where commerce is most valuable, it would be possible to reach Timbuctoo in six days from Algiers; or say a little more than a week to pass from Marseilles to the heart of the Dark Continent.

OF INTEREST TO OIL CONSUMERS.—The greatest difficulty encountered in the refinement of oil consists in the trouble experienced in combining in the same brand high gravity, high fire test and free burning qualities. It is universally conceded that the best quality of crude oil which has yet been discovered is found in Washington county, Pa., and the finest well of that locality supplies an oil from which has been produced a superior brand named the "Extra Star" kerosene. This oil is made by only one refinery in the United States. It is perfectly water white, and is said to be the only oil that will stand the "polariscope" test.

A HOUSE FLY is born fully grown and of mature size, and there are no little flies of the same species, the small ones occasionally observed being different in kind from the large ones. The house fly does not bite nor pierce the skin, but gathers its food by a comb or rake, or brush-like tongue, with which it is able to scrape the varnish from covers of books, and it thus tickles the skin of persons upon which it alights to feed upon the perspiration. The fly is a scavenger, and is a vehicle in which contagious diseases are spread. It poisons wounds, and may carry deadly virus from decaying organic matter into food.

ELECTRIC LIGHTING, says M. Fontaine, did not make its appearance until the close of the year 1873. It was in Paris, in November, 1873, in the workshop of M. Gramme, that the first installation on a really industrial scale of electric lighting took place.

ELECTRICITY.

By Balloon to the North Pole.

Two members of the Paris college of aerial navigation—M. Besancon, aeronaut, and M. Hermite, astronomer — propose seriously to reach the north pole hy mesns of a balloon aad havs explained to tbeir colleagues the meane hy which tbey hope to succeed in their object. The balloon in which they are to travsl will be made of twn thicknesses of Chinese silk, oovered with an impenetrable varaish, will bold about 45,000 cabic feet of pure bydrogen gas and carry a weight of over 8000 pounds. Thay will also take with them four small pilot balloons, which will he sent up from the north pole—should they ever reaob that mucb-longad-for spot—to test the air currents prevailing there, aad four buge bags of hydrogen gas to replenish the large balloon shonld wasta occur.

Tbe car in which ths aeronauts will bava to live is to he coated with thin steel, and will contain, in addition to its human occapants and their scientific instruments, eight dogs and a sleigh, a small, nnsinksble canoe, and provisions for a month. In order that tbe balloon may be kept at a ragular distance from the earth it will be furnished with a heavy rope and an anchor to drag along tho surface either of ice or water.

The intention is to eqaip two vessels at a Frenob port and sail to Spitzhargen. Tberc the hydrogon gae will be manufactnrad and the great halloon and its satellites inflatad, the aeronants starting on their voyage of discovery with the first favorable wind. They expect to ha about ten daye in tha air, aod to he ahle to take pbotographa and scientific observations. Where tbey will descend thay heve no idea, hut if all goes well thay bope to reach some civillzed point either in North America or western Asia.

The duration of tbe expedition from Frsnoe and hack is estimated at six months, and tbe oost is pnt down at naarly £23,000, tha larger part of whicb goes for the hire and equipment of the two vessels at Spitzbergan. This will be mainly defrayed by tbe aeronauts themselves, assisted by subsidies thay bopa to receive from hoth English and French scientifio sociatles.

Tbe start will not ha made until May, 1892, the interval being devoted to expariments to ascertain bow long it is possibla to remain in a halloon without descending. The project is attracting mnch attention in scientific circles in Paris.—*St. James Gazette.*

Definition of the Term Volt.

A definition of a "volt," wbich, although somewbet unscientific, may prove suggestive to lay readers, is given in the Chicago *Evening Post* in the following terms: "The volt gives one blow of a specified force. As volts are added tegether, the force of the blow is increased until the endnrance limit is resched. It takes about 25 volts to make a perceptible tingling sensation. Wben 50 volts pass throogh the body the tingling sensation becomes unmistakahle, bnt not strong, while 100 volts feels lively, 200 volts strong, 300 volts powerful, 400 volts, Titanic, and 500 volts will knock a man flat." In tbis connection tbe followiag in regard to

The Definitinn of Ohm

May be of interest. The Boston *Journal of Commerce* says: One is reminded very often that the electric bnsiness is still in its infanoy, and lately by the determination of a new definition of the electrical unit, the ohm. It is now rocommended tbat the ohm be defined by the resistance of a mercury column of one sqnare millimetre section, 106 3 centimeters long, 0° C. The British Association makes tbe definition wbich will probably be adopted by the different governments. In the history of the steam engine it waa a long time before units beceme settled, and not till 1849 that Joule announced the results af his experiments on tbe mechanical equivalent of heat, giving the standard of to-day. In early days pressure was designated by inches of mercury instead of pounds, and many experiments were made to determine the force of steam of different temperatures, in inches of mercury. Steam gauges at that time were mercury gauges, and the pressure designated hy the hight a column of mercnry was raised by the pressure of steam. These also served another purpose of acting as a safety-valve, the excess of pressure blowing the mercury out of the tube into a vessel, and providing an escape for the steam.

ELECTRIC WELDING is getting into a shape where it is practicable. Steam pipes can now he placed end to end and heated to such an extent where they come together that there is nothing to hinder getting a perfect weld, so much so that they can be rolled up into a continuous spiral coil without any regard to the joints, a process that is found to he of great use in the manufacture of ice-making machines. If steam pipes can he united in this manner so perfectly, there is no doubt that cross pipes can he attached as well, and a tubular boiler constructed on the most improved plan, that will he cheap and simple, with no chance to explode, with all the heating surface and steam room that could be asked for.

ELECTRIC ELEVATED RAILWAYS.—The action of the city of Boston in essaying to effect on an elevated railway the same snccessful and profitable developments of electrical traction which it has accomplished on its surface lines, is regarded with much interest by electricians all over the country. One of the greatest objections to elevated railways has always been the use of steam locomotives, with their disagreeable accompaniments of noise and smoke and cinders. With the heavy locomotives, too, required for steam traction, a very cumbrous structure was needed, hut with the use of electricity, cars lighter and of more ornamental construction can be adopted. This new departure of Boston seems likely to inaugarate in city travel an era long desired. It is now mentioned as a fact that a mile an hour hetter time is made in Boston hy the surface electric cars than in New York hy the steam cars of the elevated roads.

USEFUL INFORMATION.

A Singular Fad.

According to a Rochester paper, the "iron man," so well known to the fireman of western New York, is now a member of the Protectives of that city. For the benefit of the ignorant it may be stated that the iron man is an iron figure of a fireman standing nearly three feet high, and belongs to whatever fire company can *steal* him. To whom tha iron man originally heloaged is not known, hut in the last ten years ha bas graosed tha fire-houses of varicus New York aad Csnadian fire companies. Tbe possession of the man is a scuroe of great pride to a company. He is naver given away. He must be *stolen*, and the theft is nevar questioned hy tbe company losing tha mucb-desired trophy. Several years sgo tha iron man was stationed on the engine-house at Niagara Falls, but on the occasion of a tournament there he was stolan hy a St. Catharines ocmpany and taken to Csnada. There he ramained for some time, hut be was not safe from covetous fireman, snd during a convention in St. Catbarines ba was captnred by the Hydrant Hose of Lockport and carried to the latter city, whera he was fastened in front of tha aompany's bouse. For greater safety tbe man was attached to a solid steel rod, tha latter running back into tha bose-house and being fastened close to one of the "bunkers'" quarters.

The iron man had not been long in tha City of Looks before the Warner Chemicsla of Albion cast longing ayes upon him, and one night about four years sgo thay made a quiet visit to tbe Hydrent's headquarters, and after several hours of herd labor filed the steel rod and carried off the man without awakening the "bunkers." Tbe Albion boys hired a steeple-olimber from Rochester to go to that village and put tbe trophy upon tbe very top of the tall hose tower. Here, away up above the busy world, it was the popular belief in Albion, the iron man wonld spend the rest of his days. And for four years be had remained. But when tbe Rochester Protectives went up to Albion recently to take part in tbe annual parade, tbey decided that they wanted that man, and shortly after midnight D. K. Carter scsled the wall of the tower, and at the risk of his life brought tbe iron man cnce more to earth. So fearful was the captor thst the prize wonld he wrested from him that he hired a hack and drove to Rochester with the trophy. On the top of the Rochester Protectives' house is a niche, and here the iron man is placed. The members of the company feel confident tbat there he will he sefe, hut it is likely that not yet has the iron man completed his travele.

WHAT THE WORLD OWES TO CRANKS.—It was to tbe courage and perseverance of a crank that we owe tbe discovery of this great hemisphere. It was a crank that gave us the printing prese, tbe cotton loom, the locomotive, the telegraph. All the great inventors, from Archimedes to Edison, have heen cranks; all the great philosophers, from Plato to Herbert Spencer; all the reformers, from Lycurgus to Lady Hahhertoo; all the great preachers, from Peter the Hermit to Henry Ward Beecher; all the heroes who left their plows standing in the furrow while they went to fight for liberty under Washington.—*Kate Field.*

A CURIOUS FACT in statistics of population is the greater number of people whose age is expressed in decimals of ten. For instance, in the last oensus of Rhode Island there were more than twice as maay people 50 years old as there were 49. So, again, it wes shown that there were in a certain county 2000 colored people 69 years old, 1200 seventy-one, and 19,000 seventy. The fact is a striking illustration of the general fondness of people for round numbers. A man who is 59 or 61 years of age is quite apt to call bimself 60, and in a similar case a woman will call herself 40 or 50.

HOW TO REMOVE OIL-MARKS ON WALLS.—Oil marks on wall paper, where careless people have rested their heads, may be removed hy making a paste of cold water and pipeclay or fuller's earth and laying it on the stains without rubhing it in; leave it on all night, and in the morning it oan be brnshed off, and the spot, unless it he a very old one, will have disappeared. If old, renew the application.

A FIRE was caused in a singular way the other day in Highland Park, opposite New Brunswick, N. J. The handsome country residence of Peter Zimmerman was discovered to he on fire. Tbe flames were first seen in a bay window at tbe east end of tbe third-story ball, where tha sun was shining in. It is concluded tbat the fire was started hy a dimple in the wiadow glass contracting the sun's rays.

GOOD HEALTH.

Electrical Remedies.

A contemporary gives tho followiag: Tbe number of electrical appliancee for wearing upon the human body are almost numbarless. Toore are many paople who beliave that aleotrical helts, brushes, combs, etc., have a stroag curative powar. There are also found people who will carry a piece of potato in their pocket as cure for rhaumatism. The latest fad in this lina is to carry a bit of electric arc-light carbca, that some of the electricity left over from last night's lighting may soak into their hodies and ease up on tha pain a trifle.

All these notions have not the least foundation; a person may stand hetween the poles of the most powerful magnet yet laventod, and stroag enoagh to lift hundreds of ponads of iron, and never feel tha slightest magaetism, either for good or for ill. A theory is in axistence that tbe magnatism attracts the iron in the hlood snd thus starts up a better circulation. All tbe iron that exists in the human system is combined with hydrochloric (muristic) acid and is in the form of the oxida of that metal, snd in this form the magnet has no power over tbe oxida of iron; and if a person's blood does not oirculate until it is started up by magnetic effect npon iron contsined therain, it would not oirculate more than nnce during the coming century.

There is a great deal in tbe use and abuse of imaginstion, and people who are taken violently ill after ridlng a few blocks on electric cars ara ready to be reted as first-class cranks as far as imagination is concarned. A current of *electricity* passing through the body may benefit hy agitating and perhaps decomposing certain portions of the tissue, hut *magnetism* has no effect whatever npon the human syatem.

A little electricity goes a great way in this respect; physicians, in giving alactrical treatment, usa from one to five one-thousandths of an ampera. From two to four amperes passed throagh tbe vital parts of the humau body is sure death. Tha tissues cannot staad so violent an agitation. Tha resistance of the hody is so great that hundreds snd perhaps a thousand volts nressnre is necessary to force this amount of current through the body.

When mesning to take a little magnetism or electricity for the hody's good, it might be well to have the electricity applied hy a responsible physician, hut do not go to the trouble of taking your ride on the field magnet of a light dynamo, or sandwich yourself between the poles of a big alternating current machine.

HEALTH OF THE STATE.—The report of tbe State Board of Health gives mortality reports for November from 103 localities, with an estimated population of 752,739. It shows an annual mortality at the rate of 18.60 per thousand, which is the largest death rate we have had for many months. This increase is due to the increased area of country in which diphtheria, typhoid fever and acute palmonary diseases have been present. The mortality from pneumonia, for instance, just doubled that for October, and the deaths from diphtheria and croup were also largely in excess over the preceding month. Consumption caused the death of 157 persoas—an increase over last month. Pneumonia was fatal in 110 instancee, bronchitis caused 24 deathe, congestion of the lungs was fatal in 19 cases, and whooping cough caused two deaths. Diphtheria is credited with 58 deaths, which is a largely increased mortality over last report. Thirty-seven of these deaths occurred in San Francisco.

DANGER FROM MUSICAL INSTRUMENTS.—A French military surgeon has been making researches on wind instruments which had been used hy phthisical handemen, and warns musicians of the importance of disinfection. He recommends that instruments should be filled with a five per cent solution of carholic acid, or, in tbe case of metallic instruments, that they should be dipped into hoiling water. These precautions are of the utmost importanoe when phthisical persons have used the instruments; for it wss found in such cases that liquids used to wash them ont presented a virulence similar to that of a pure culture of tuberculosis. Happily, the danger is small as long as the interior is thoroughly moist, which of conse it usually is; but when an instrument bas heen lying hy for some time, so that the interior has hecome dry, there is real danger of air containing dried germs of the disease being drawn into the lungs of the person who next plays upon it.—*New York Ledger.*

SCIENTIFIC STUDY OF DRUGS —Bnt little is known of the action of drugs on the human body in health. For a number of years an English hiologist, W. Sharp, has heen experimentlog to determine this action, using different quantities of the same drug, and he has reached some interesting conclusions, including the following: The smallest doses used in these experimente have power to act upon the human body; the commonly received opinion that the action of drnga is simply increased in degree and not altered in character by increasing the dose, is an error; the actions of drngs are sufficiently distinct to admit of classification.

ENGINEERING NOTES.

Engineering Progress.

The *Stationary Engineer*, in urging tbe necessity of study upon youag engineers, says:

Granted that owners are sometimes short-sighted and are over-inclined to value your services in inverse ratio to the money you demand for them. Do you intend always to work in the same place? Do you not rather cherish the honorable ambition to better your condition whenever opportunity offers? Do you ever stop to consider the great changes which have taken place in the character of tha steam plants of this country, and that the change is still going on in a constantly accelerating ratio? Some one has well said that there is always room at the top; and in the stationary engineer's trade this room at the top is growing larger all the time. Think the matter over, and you will soon he convinced that not one of the mechanical trades has in it more of possihilities for tha future, or offers more encouragemant to hard study, patient industry aed steady application than the one you have chosen.

It is not so very many years since tha old-fashioned slide-valve aagine, with its box-bed and trotting governor, was to ha found in nearly every engine-room. Now it is hardly thought of except for the smallest and cheapest plants. It is scarcely a dozen years since tha first successful attempt was made to build Corliss engines in tha West. To-day there are dozens of hnildare of this and other types of high-duty engines. The automatic cut-off engines have driven the slide valve nut of tha market, except for small powers. Compound engines are common, and tripla and quadruple engines are not only heing talked of, but are being placed in operation, and will undonhtedly be as generally used in stationary practice as they are now in marine engineering. Thousands of first-class plants are in daily service, and the demand is growing steadily. Every one that is put in service calls for skilled attendanca and farnishes work for a good engineer.

The signs of the times all point to a continuance of the attempt at still further improvement in the economy and efficiency of the modern high-duty steam plant. As a natural result the demand for skillful, educated engineers is increasing. Not only this, hut the nnmber of first-class power plants is rapidly increasing to meet the manifold requirements of our later-day civilization. Naturally, the engineers who study tbe hardest, and are the most thoroughly posted in the practical details of tbe trade, will get the best positions, and the best positions are worth working for.

THE CORINTH CANAL.—The Corinth canal, which will sever the Peloponessus from tbe mainland of Greece, and will permit the largest ships to pass directly from tbe Gulf of Athena to the Gulf of Corinth, is said to he rapidly approaching completion. A recently published account gives some interesting particulars concerning the undertaking. The work was begun some eight years sgo by a French company. It was to have been finished in 1887, hut various troubles delayed it, and now 1895 is named as the earliest date on which it can he opened for traffic. The canal will have no locks, but is level from end to end and perfectly straight. It is to he 96 feet wide and 36 feet deep. At the Corinth end it is crossed by a railroad hridge 164 feet high, nnder which the tallest ships may pass without lowering their topmasts. With the exception of about 200 yards in the center, the channel, it is said, has already been excavated down to the sea-level, and water has heen admitted for about half a mile at the Corinth end and half that distsnce at tbe other. The total cost of the canal is reckoned at $14,000,000. It is assumed that about 300 vessels from Trieste and Fiume, and es many from Italian ports, will pass through the canal annually, while it is calculated tbat 730 Greek ships will use the canal. This would give a total of 1230 vessels annually, of an average tonnage of 1500 each. It is proposed to levy a toll of 20 cents per ton on vessels comiag from the Adriatic, and 10 cents on all other vessels, hesides 20 cents for every passenger. This is estimated to yield an annual revenue of $300,000.

MASONRY IN ENGINEERING.—Fuel, heat and power are hardly more essential in the work of civil engineering than the perfection of masonry in connection with all important enterprises, as it lies at the foundation of nearly every class of construction, and so much of stability and adaptetion are involved in a true understanding of its principles. Every bridge, culvert, viaduct, squeduct, tunnel, seawall or edifice is dependent upon its correctness of structure, and in view of this importance it necessarily hecomes a study in intimate relation with architecture and the conservation of mechenical appliances.

THE LATEST PROJECT IN INDIA of railway extension consists of a line of railway running parallel with the east coast, connected with the Bengal-Nagpur railway, affording to the southeastern districts of the central provinces direct means of access to the sea. The Ceylon railway authorities are laying down a line of railway in Colombo, which will probably be continued to Matwal.

MINING AND SCIENTIFIC PRESS

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W. B. EWER.....SENIOR EDITOR

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Assessment Notice—Gray Eagle Mining Co.
Dividend Notice.—German Savings and Loan Society.
Dividend Notice—San Francisco Savings Union.
See Advertising Columns.

Passing Events.

The past week has come and gone without impressing itself deeply on the mining history of the country. It brought with it no startling incidents or events to record, the which is perhaps matter for thankfulness. Better a tame week than one marked with disasters, and these we as a community have fortunately been spared. Christmas found us a generally prosperous and happy people. Our affairs, public and private, are calculated to inspire us with profound gratitude, the conditions of life in California being so incomparably better than in any other country, even the most favored. We experience here no pinching cold, no oppressive heat, no dire want. We enjoy a large aggregate of comforts, far more than the average of mankind. With us the general health is good and the death rate low. Appreciating these and numerous other blessings, the popular heart was inspired with devout and grateful feelings on this natal day of the Redeemer.

WILL APPEAR NEXT WEEK.—Another number (24) of the series of articles on San Bernardino county, prepared for the PRESS by James H. Crossman, will appear in our next issue, it having been unavoidably left over by reason of the overcrowded state of our columns of late.

The Real Death Valley and the Mythical.

There appeared in the last issue of the PRESS a somewhat lengthy description of Death valley, an arid and forbidden locality situated on the easterly border of this State. In reproducing that article from one of our metropolitan dailies, we did so, not with the intention of indorsing its correctness, but the rather with the purpose of pointing out certain of its inaccuracies and rectifying the same, these being altogether mythical and misleading. In so far as the writer of that article deals in mere generalities, surmises and impressions, these may be allowed to go for what they are worth. But when it comes to statements of facts, these, where wide of the truth, would certainly seem to call for correction.

Before proceeding to act the critic, it is proper to premise that we have undertaken this task reluctantly and not in a spirit of censoriousness, having been constrained thereto purely in the interest of truth and science. If this Death Valley region is not the dangerous and dismal waste generally represented, it is proper the Government, in preparing an expedition to explore it, should be advised of that fact, to the end that no uncalled-for expense be incurred in fitting out the same; and so, for the same reason and in like manner, should the expeditionists themselves be saved from providing what might afterward be found a useless incumbrance. Moreover, it is the case that the prospector and the miner should not be allowed into a country difficult to be reached and of doubtful mineral wealth through the extravagant stories related by mere Bohemians and romancers.

How necessary are the above precautions will be made apparent when we come to examine a little more closely the article in question. For example, we find therein the following statement during the mining fever extending from 1872 to 1873: "Hundreds of people perished in attempting to get across this valley." What fever the writer alludes to is more than we know. If he means to convey the idea that there ever prevailed an excitement that caused any large number of people to visit Death valley, or that several hundred or any other considerable number of lives were there lost during that period, we think he is laboring under a misapprehension. We never heard of any such movement, nor do we believe any ever occurred.

As to the number of persons who have been lost in this locality, it does not probably exceed 30 all told, the most of these consisting of the immigrant party who, to the number of 13, perished there in the summer of 1849 while attempting to make a cut-off on their way to California. If as many more lives have since been lost there, we have no authentic record thereof. This immigrant party, composed largely of women and children, were no doubt the first whites to succumb to the heat and want of water in that fatal spot. That none of the aborigines ever fell victims to either, it is useless to state.

It becomes imperative, says our informant, that adventurers into that region make provision for taking along an abundance of water, the necessity for this being enforced with the remark that three gallons daily per head is as little as will suffice to sustain life; with less, the blood of the unhappy individual "becomes thickened, the features grow thin and peaked, dreadful constipation sets in and fever threatens madness." When crossing Death valley several years ago, we found a much less quantity of water than this quite enough to satisfy the cravings of thirst, nor when, as occasionally happened, the supply ran a little short, did such extreme suffering, with the dire results here described, at once ensue.

This is not to say that parties contemplating a trip into this notable depression can safely disregard the precaution suggested, unless, to be sure, they know the sites of the springs in the mountain canyons adjacent or have with them some one conversant with their location. If they possess this knowledge or will take care to pick up an Indian in the neighborhood to act as guide, they need never load down their animals with more than one day's supply of water, or two at the most. As there is water, so is there wood and grass to be obtained in the mountains, close by on the east but from 10 to 15 miles distant on the west, none of these prime necessities being, even in the mountains, overabundant. There is always there grass enough to subsist the animals and wood enough for camp purposes, but the springs, never copious, are found in only a few of the canyons, all of the watering-places being, however, known to the Indians residing anywhere near.

But while enough of these indispensables, suitable precautions being taken, can be found to meet all needs, he who hazards into this hot and drought-y realm may not presume on local resources for other supplies. Both animal and vegetable life are now notably absent, their dearth being nearly as great as that of wood and water. The animality of the district includes little more than lizards, rattlesnakes and horned toads. The Government, we are told, is anxious to ascertain and catalogue both the fauna and the flora of this vast receptacle of sand, soda and salt. It is a commendable if not very formidable undertaking. If now the Government, moved by such laudable ambition, will consult some of the earlier reports of the United States Geological Survey it will find there recorded and ready for its use about all the data extant or procurable on that subject. If these reports shall be found a little difficult, it must be remembered that the collection of the facts therein contained was a case of the "pursuit of knowledge under difficulties."

In regard to the rich gold finds reported as having at various times occurred in Death valley and vicinity, these are quite as apocryphal as the high death rate assigned that delectable locality. There are, in fact, no well authenticated cases of the kind; they are mostly myths, pure and simple, and it is to be hoped that our miners will not be induced to go in search of these reputed finds by reason of this renewed attempt to give them unmerited notoriety.

Pioneer Gold Mining.

Handicapped by Many Disadvantages.

It has generally been supposed that the business of gold mining in California was inaugurated under circumstances especially favorable to the growth and early perfection of that industry; this is the theory held by most early residents of the State, and the historical view taken of that event. To suggest the contrary would be held by the average pioneer a grievous heresy. It has, in fact, been the wont of our people to congratulate themselves on the auspicious conditions under which gold gathering was here first carried on. And yet this view of the situation is clearly untenable. Our great industry was, at its inception, handicapped by the worst possible surroundings—surroundings so bad that it was sadly stunted in its growth, the effects of that dwarfage being seen and felt to this day.

Gold during the first decade was, to be sure, plentiful and easily obtained; and right here lay the trouble. The early miner, because he could earn big wages with little exertion, soon became improvident and careless. This stage reached in his downward course, it was but a step farther to idleness and dissipation, the end of which was early and absolute ruin. This, of course, was not the fate of all, or even of a majority, but it was of a great many, such condition of things having proved generally hurtful and demoralizing. Habits of this kind contracted during the flush times adhered to the individual after these were over, leaving him a moral and a physical wreck.

But the facility with which gold could at first be obtained, while it so tended to demoralize the miner, worked to the detriment of mining as well. When the quartz veins and the deep-lying placers came to be opened, the shallow diggings having been exhausted, our miners had as little stomach for this more arduous kind of work as they had money to pay for its performance. Hence, this class of deposits was neglected or attacked in only a faint-hearted sort of way, such of these men as had sufficient means either leaving the mines or emigrating to other countries in search of virgin placers.

How different probably would all this have been had there been found in California only vein mines or deep placers at the start! With such deposits only to deal with, there would have been little to induce dissipation, idleness and unthrift. Their development requiring capital, skill and good management, the malign influence and conditions that so obtained in the early days would have been largely if not wholly absent. The bulk of laborers, everything considered, would have fared equally as well as they did, while the business of mining would have been immeasurably further advanced than we now find it. So far as solid progress is concerned, fully a third of the time that has elapsed since the discovery of gold in California has been virtually lost.

During the first decade of the gold era, there was to be seen here only a wild scramble after pelf, nothing but adventurers swarming in from other lands all intent on that one object, but careless of everything else besides; California during all these years having been converted into a sort of "grab-bag" for all the world. Never could mining in this country have met with large development, nor could any other substantial industry have obtained here an enduring footing had this condition of things continued to prevail.

A nomadic people can never make rapid progress in civilization, nor are they apt to attain to a high morality. They must themselves become permanent before they can establish permanent institutions and industries. Intelligence must be combined with labor, brains with brawn, before useful callings can prosper or other solid advancement be made. Ready to pack his blankets and scurry away in search of new diggings on the slightest intimation that such had been found in some distant locality, the early miner would never have done much towards making California what she is to-day. The home of the miner was then hardly more than a Gypsy camp, his hold on society as slight as that of a Bedouin of the Desert. The digging of gold in the primitive times here alluded to called for hardly more skill or labor than the digging of potatoes—not half as much of either as is required for the successful cultivation of that useful tuber.

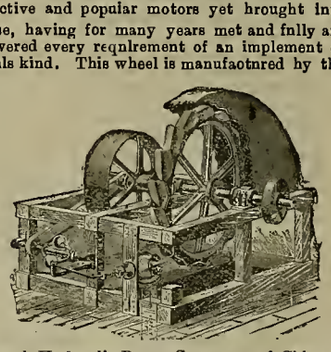
The pioneer miner was a man of many good qualities, brave, generous, hardy and industrious enough when there was big pay in sight, not often otherwise. He was a pathfinder and an explorer. He was a man to discover good places for homes, but not to make a home for himself. The country and the world owes much to him, and we would be the last to disparage his virtues or depreciate the value of his services.

But it seems to us the day has come when we may properly cease to deplore the passing away of those flush times about which we hear so much, and so many, in their ignorance, would gladly see restored. Their advantages, such as they were, have been greatly overrated, partly because they have been sung so much and partly because they have been so widely lamented.

Let, then, the present generation, be advised that they have lost but little in not having lived in the wild and wasteful period here commented upon, and let the California of to-day be advised that it gained less through the existence of that period than has generally been supposed.

The Tuerk Mining Wheel.

The above cut represents what is known as the Toerk Mining Wheel, one of the most effective and popular motors yet brought into use, having for many years met and fully answered every requirement of an implement of this kind. This wheel is manufactured by the



Tuerk Hydraulic Power Company, of Chicago, and by them supplied with their automatic governor, which materially increases the efficiency of their motors for dynamo and all other work calling for close regulation of speed. The mechanisms of this company are said to be gaining favor both with the mining and manufacturing public.

OUR ARTICLE ON CHLORINATION.—We reproduce in this week's PRESS an article on chlorination, prepared by Wm. Irelan, Jr., State Mineralogist, and published in his annual report for 1886. We do this because there has been much inquiry for that report, which, being out of print, can no longer be had. This article is suggestive rather than exhaustive, dealing with the subject treated of in a general way. It was made short that it might be conveniently reproduced by the mining press, as it probably will be quite generally, now that the volume in which it originally appeared is difficult of obtainment. An additional reason for the brevity of this article is found in the fact that several works on chlorination had appeared or were about to do so at the time of its preparation, to some of which Mr. Irelan had himself contributed.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING DEC. 16, 1890.

443,064.—GOVERNOR FOR GAS ENGINES—Barrett & Daly, S. F.

443,083.—SYRINGE—E. Bartsch, S. F.

442,939.—WAVE-POWER—J. Beermaker, Santa Barbara, Cal.

442,700.—CAR BRAKE AND STARTER—E. Chaffey, Santa Monica, Cal.

442,961.—FIRE-ESCAPE—E. W. Dixon, Forest Grove, Or.

442,963.—ROTARY GAS ENGINE—J. H. Eichler, S. F.

442,692.—MACHINE FOR MAKING ROCK-DRILL BITS—S. C. Lewis, S. F.

442,814.—CAR COUPLING—J. E. Marshall, Martinez, Cal.

442,815.—MACHINE FOR REDUCING BITUMINOUS ROCK—W. Meakin, S. F.

442,906.—DISH-WASHER—Addie D. Miller, Portland, Or.

442,779.—VEHICLE WHEEL—V. F. Mogk, Seattle, Wash.

443,002.—DOUBLE CUTTER-BAR FOR HEADERS—Plumtree & Tonnett, Spokane, Wash.

442,780.—WHEEL FOR ROAD ENGINES—R. B. Page, Oakland, Cal.

442,644.—FOUNTAIN PEN—P. B. Smith, Alameda, Cal.

442,762.—VAPORIZING SPRAY NOZZLE—W. Wainwright, S. F.

442,837.—PIPE COUPLING—H. B. Ward, San Diego, Cal.

442,652.—STREET RAILWAYS—Watriss & Heynemann, S. F.

442,838.—NAIL HEAD—O. F. Wegener, Seattle, Wash.

442,845.—ANIMAL TRAP—White & Murphy, Pomoca, Cal.

442,835.—ENGINE—J. C. H. Stut, S. F.

The following brief list by telegraph, for Dec. 23, will appear more complete on receipt of mail advices:

California—George B. Allen, San Leandro, baling press; Fay Butler, Oakland, bitt file; Thomas C. Hope, San Francisco, combined and adjustable screen and window-shade fixture; Charles C. Davis, Los Angeles, device for inducing full respiration; Bert Franken, Pomona, lawn sprinkler; Thomas B. Jordan, Los Angeles, fruit-pickers' knife; Lewis M. Lloyd, San Buenaventura, wave and tide motor; John McMullen and H. S. Wood, San Francisco, and H. Krusi, Alameda, canal-digging machine; John Schroeder, assignor of one-half to H. L. Raschen, San Francisco, propulsion of vessels; James Tulloch, Angel Camp, ore concentrator. Oregon—Matthias Jensen, assignor of one-half to Jensen Can-Filling Machine Company, Astoria, seaming machine; Andrew C. Mack, Portland, millinery hat or bonnet box; Levi M. Sharps, deceased, Lake View, by W. M. Sharps, administrator, water wheel.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co., in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

VIEW OF MT TACOMA FROM AMERICAN LAKE.

EASTERN VISITORS TO CALIFORNIA IN SECTION OF BIG TREE AT VISALIA, CAL.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ANIMAL TRAP.—Frank White and Frank J. Murphy, Pomona, Cal. No. 442,845. Dated Dec. 16, 1890. This invention is a trigger for those traps which have spring-controlled jaws, and are usually made of wire. The trigger consists of a notched plate having inner and outer shoulders at its base for pressing against the jaw stems to hold the jaws open and a flange at each side resting on said stems, the flange on one side extending forward and the flange on the other side extending backward. These flanges serve as levers to disengage the shoulders when the plate is tilted in either direction.

ENGINE.—John Ch. H. Stut, S. F. No. 442,835. Dated Dec. 16, 1890. The invention consists in certain constructions whereby a series of engines connected with a single driving shaft may be coupled together in such a way that any one or more of the engines may be uncoupled and the others coupled together, in order to be used while the disconnected engine or engines is or are out of use. The patent shows a triple expansion engine driving a common shaft, and a series of pass pipes and valves by which the result may be effected of temporarily cutting out one or more of the engines, leaving the others operative. A similar arrangement may be had for more than three engines.

A Large Tree.

The cut herewith presented shows what is left of one of California's big trees. Although these remains show little more than the bark, this sufficiently denotes what was originally the size of this monster of the forest, its diameter having been something over 20 feet. This tree grew in the reservation in Tulare county, where one of these sequoia gigantea of much larger size is reported to have lately been found. According to accounts, this late find measures 124 feet in circumference. Among the California big trees, none has shown a larger girth than this, though many have short equaled it.

A Washington Scene.

Mt. Tacoma, as seen from American lake, is one of the grandest sights of the Northwest. Rising abruptly to a hight of many thousand feet, and crowned with a chaplet of snow, it forms one of those periods of Nature which leaves an indelible impress upon the beholder. The placid surface of the lake is covered with small verdure-clad islands, and forests stretch away from its shores.

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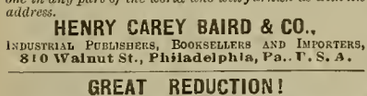

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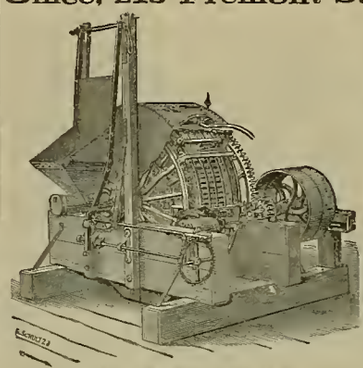

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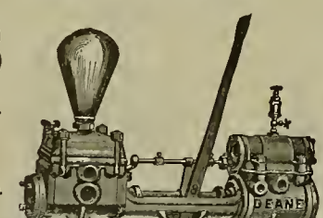

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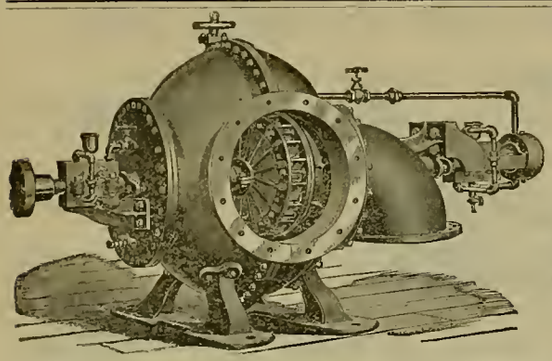

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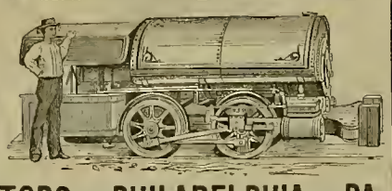

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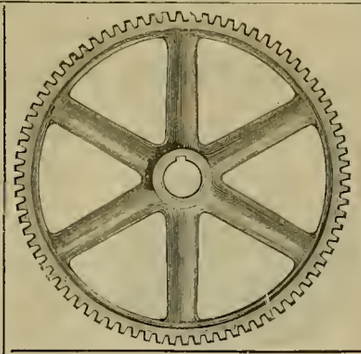

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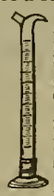

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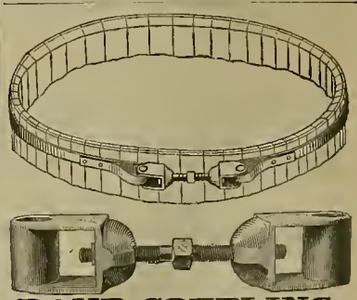

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Table of Lowest and Highest Sales in S. F. Stock Exchange.

NAME OF COMPANY.	WEEK ENDING Dec. 4.		WEEK ENDING Dec. 11.		WEEK ENDING Dec. 18.		WEEK ENDING Dec. 24.	
Alpha	.95	1.30	.90	1.05	.75	1.05	.75	.90
Alta	.90	1.10	.80	.90	.50	.75	.60	.70
Andes	.80	1.00	.80	.85	.55	.80	.55	.70
Belcher	1.80	2.25	1.70	1.90	1.25	1.70	1.25	1.45
Best & Belcher	2 20	2.45	2.20	2.45	1.85	2.40	1.90	2.10
Bullion	1.75	2.30	1.75	2.10	1.45	1.90	1.55	2.10
Bodie Con	.90	1.10	.85	.90	.50	90	.55	.60
Bulwer	.25	....	.20	....	.15	.20	.15	....
Commonwealth	1.90	2.15	1.25	2 00	1.00	1.25	.75	.90
Con. Va. & Cal	3.15	3 60	3.05	3.20	2.55	3.10	2.60	2.70
Challenge	2.05	2.30	1.80	2.15	1.45	1.8	1.50	1.60
Dollar	4.75	3.60	2.35	3.05	1 95	2.80	2.05	2.40
Confidence	....	....	4.00	4.70	3 80	4.10	4.90	5.25
Con. Imperial	.25	.3.	20		.15	.20	.15	....
Caledonia	.35	.	.30	.40	.25	.35	.30	.35
Crown Point	1.55	2.10	1.50	1 70	1.10	1 50	1.10	1.20
Crocker	....	....	.20	....	.10	.15	....	....
Del Monte	.55	....	.50	....	....	....	....	....
Eureka Con	3.75	....	....	....	....	....	....	....
Exchequer	.65	.85	.60	.7	.40	.65	.40	.50
Grand Prize	.30	....	.20	.25	.15	.20	.15	....
Gould & Curry	1.45	1.75	1.50	1 80	1.05	1.50	1.15	1.30
Hale & Norcross	1.60	2.00	1.40	1.75	1.15	1.75	1.15	1.45
Julia	.20	.30	.15	.20	15	20	.15	....
Justice	1.10	1.15	1.05	1.15	.85	.90	.85	.90
Kentuck	1.10	1.50	1.05	1.25	.75	1.10	.85	1.05
Lady Wash	.30	....	.25	....	.15	.20	.20	....
Mono	.60	....	.70	.75	.40	....	.40	....
Mexican	2.50	2.70	2.45	2.75	2 10	2.55	2.10	2.35
Navajo	.35	....	.25	....	....	....	....	....
North Belle Isle	1.00	1.20	.70	.90	.70	.80	.70	.75
Nev. Queen	.75	.90	.50	.60	.40	.50	....	....
Occidental	.90	1.15	.85	.95	.65	.70	.75	.85
Ophir	3.60	3.85	3.40	3.60	2.65	3.50	2.65	2.80
Overman	2 00	2.2	1 85	2 05	1 60	2.00	1.70	1.80
Potosi	4.70	6.50	3 80	6.50	3.70	5.12	3.05	4 80
Peerless	.20	....	.25	....	.15	.20	.10	....
Peer	.15	....	.10	.20	.15	.20	10	....
Savage	1 85	2.30	1.50	1.95	1.50	1.65	1.55	1.75
S. B. & M	1 10	1.35	1.05	1 10	.75	1.10	.80	.90
Sierra Nevada	2.00	2.20	1 80	2.10	1.40	1 90	1.45	1.55
Silver Hill	.25	.30	.20	.25	.15	.20	.20	.25
Scorpion	.20	....	.20	....	.15	....	....	....
Union Con	2.00	2.20	1.90	2.15	1.50	2.00	1.55	1.65
Utah	.65	.75	.60	.70	.35	.55	.35	.45
Yellow Jacket	2.10	2.50	2.05	2 20	1.55	2.10	1 70	1.80

Sales at San Francisco Stock Exchange.

WEDNESDAY, December 24, 9:30 A. M.

200	Alpha Con	100	Gou'd & Curry
200	Andes	100	Hale & Norcross
100	Belcher	100	Kentuck
50	Benton Con	50	Mexican
100	Best & Belcher	100	N Commonwealth
900	Bullion	300	Overman
100	Challenge Con	500	Potosi
200	Commonwealth	100	Savage
100	Con Cal & V	100	Seg Belcher
200	Con Imperial	200	Silver King
400	Con New York	200	Union Con
50	Crown Point	100	Utah
300	Exchequer	100	West Comstock

Complimentary Samples.

Persons receiving this paper marked are requested to examine its contents, terms of subscription, and give it their own patronage, and, as far as practicable, aid in circulating the journal, and making its value more widely known to others, and extending its influence in the cause it faithfully serves. Subscription rate, $3.00 a year. Extra copies mailed for 10 cents, if ordered soon enough. If already a subscriber, please show the paper to others.

Attention, Southern California Miners.

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The Works are situated at Daggett, Cal., in the Calico Mining District, and on the side track of the Atlantic and Pacific Railroad. They contain a first-class 50-horse power engine and 45-horse power boiler, with Ore Crusher and other machinery, Mill Scales, Assaying Outfit, etc., all nearly new. Also upon the premises an office building and a comfortable dwelling-house (portable). The above can be had at a bargain. Apply to W. M. SMITH, 526 Jones St., San Francisco.

Don't Fail to Write.

Should this paper be received by any subscribor who does not want it, *or beyond the time he intends to pay for it*, let him not fail to write us *direct* to stop it. A postal card (costing one cent only) will suffice. We will not knowingly send the paper to any one who does not wish it, but if it is continued, through the failure of the subscriber to notify us to discontinue it, or some irresponsible party requested to stop it, we shall positively demand payment for the time it is sent. LOOK CAREFULLY AT THE LABEL ON YOUR PAPER.

The German Savings and Loan Society.

526 California Street.

DIVIDEND NOTICE.

For the half-year ending December 31, 1890, a dividend has been declared at the rate of five and forty-hundredths (5 40 100) per cent per annum on Term Deposits, and four and one-half (4½) per cent per annum on Ordinary Deposits. Payable on and after FRIDAY, January 2, 1891. GEO. TOURNEY, Secretary.

SAN FRANCISCO SAVINGS UNION

532 California Street, Corner Webb;
Branch, 1700 Market St cet, Corner Polk.

For the half-year ending with 31st December, 1890, a dividend has been declared at the rate of five and four-tenths (5 4-10) per cent per annum on Term Deposits and four and one-half (4½) per cent per annum on Ordinary Deposits, free of taxes, payable on and after Friday, 2d January, 1891. LOVELL WHITE, Cashier.

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We POSITIVELY CURE all kinds of Rupture and Rectal Diseases, no matter of how long standing, in from 30 to 60 days, without the use of KNIFE, DRAWING BLOOD, or DETENTION FROM BUSINESS. Terms: **No Cure, no Pay; and no Pay until Cured.** If afflicted, come and see us or send stamp for pamphlet. Address:

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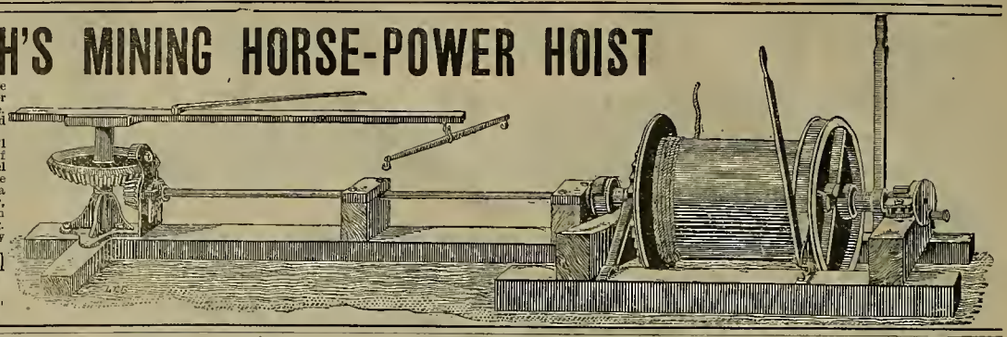

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F. W. Krogh & Co.,
51 BEALE ST., San Francisco.

Assessment Notices.

LEIGH GRAVEL MINING COMPANY. Location of principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 22d day of November, 1890, an assessment, No. 2, of five cents (5c) per share was levied upon the Capital Stock of the Corporation, payable immediately in United States gold coin to the Secretary at the office of the Company, 320 Sansome Street, Room 57, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 3d day of January, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on SATURDAY, the 24th day of January, 1891, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

E. E. FALL, Secretary.

Office, 320 Sansome Street, Room 57, San Francisco, California.

GRAY EAGLE MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 20th day of December, 1890, an assessment, No. 21, of Three (3) Cents per share, was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room 11, No. 303 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of January, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 16th day of February, 1891, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

A. W. BARROWS, Secretary pro tem.

Office, Room 11, No. 303 California Street, San Francisco, California.

INYO MARBLE COMPANY.—LOCATION of principal place of business, San Francisco, California. Location of works, Keeler, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 16th day of December, 1890, an assessment (No. 11), of Ten Cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, 132 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of January, 1891, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on FRIDAY, the 20th day of February, 1891, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

G. W. LUCE, Secretary.

Office, 132 California Street, San Francisco, California

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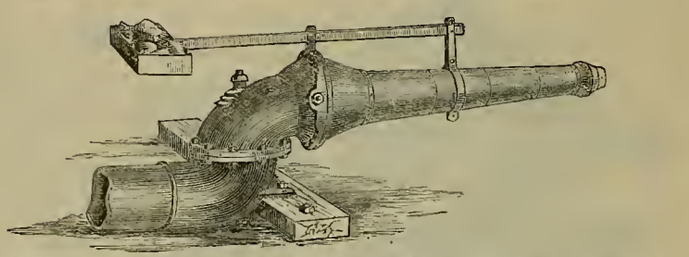

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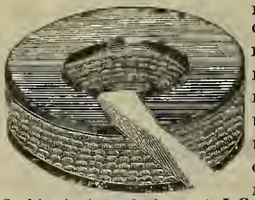

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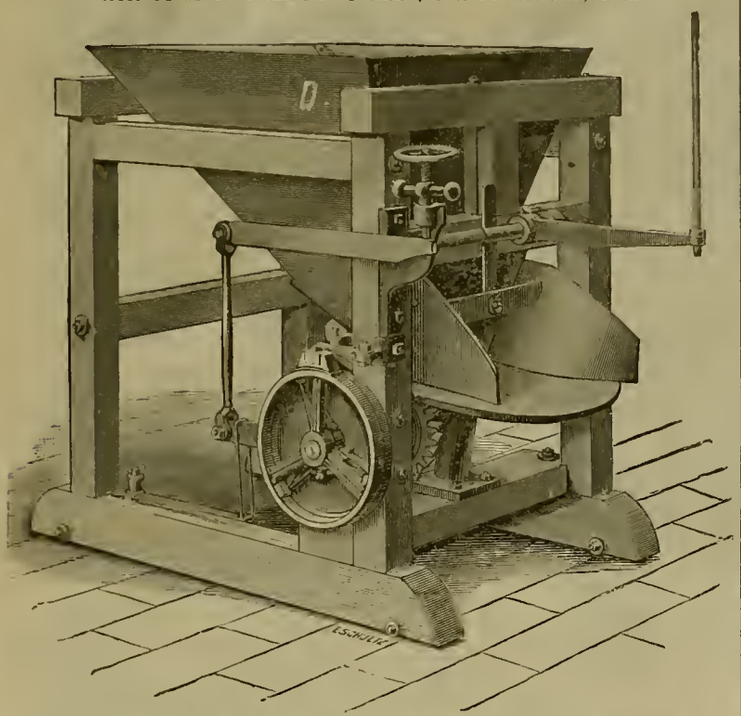

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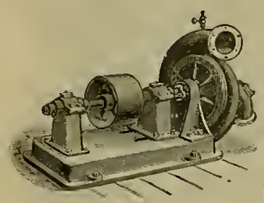

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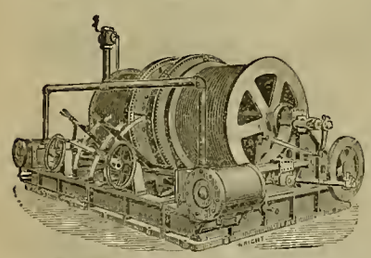

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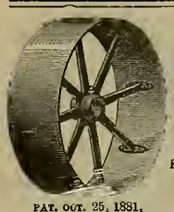

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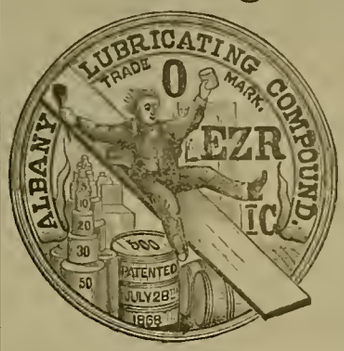

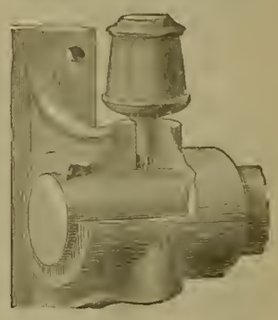

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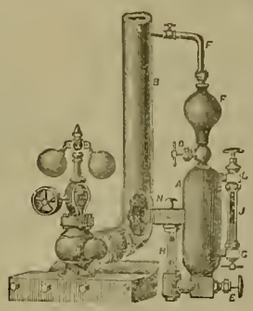

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KENDALL'S PATENT, AUGUST 24, 1886.

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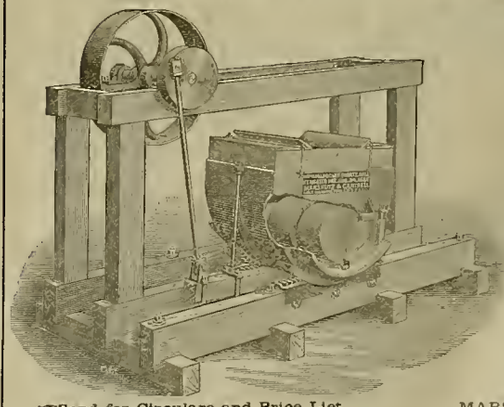

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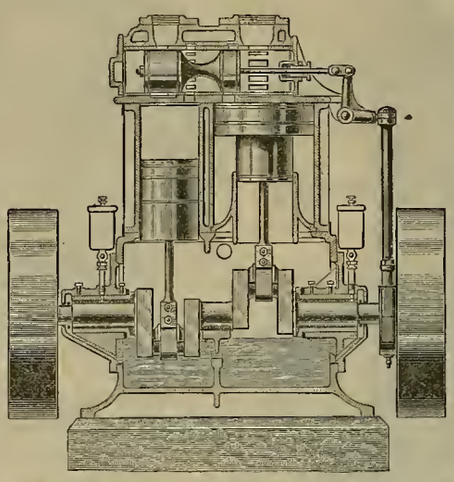
One Machine Taking Pulp from 10 Stamps.



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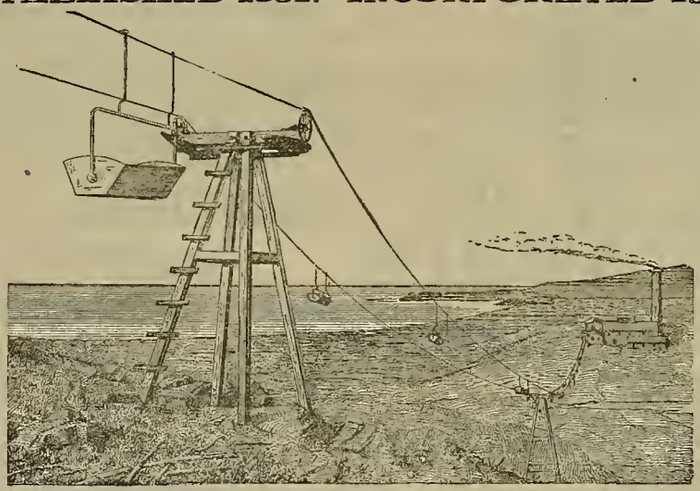

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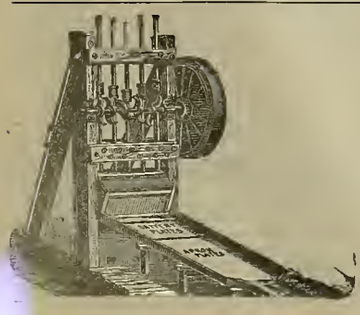

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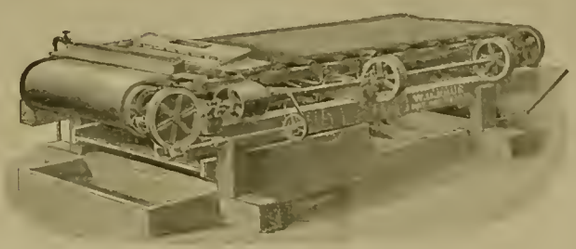

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There are Over 2200 Plain Belt Machines now in Use.

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DEAR SIRS:—Having tested three of your Frue Vanners in a competitive trial with other similar machines (Triumph), we have satisfied ourselves of the superiority of your Vanners, as is evidenced by the fact of our having ordered 20 more of your machines for immediate delivery. Yours truly, THE MONTANA COMPANY (Limited).

N. B.—Since the above was written the 20 Vanners, having been started, gave such satisfaction that 44 additional Frues and more stamps have been purchased. ADAMS & CARTER.

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The competitive trials which have been held between the "Trinmph" Ore Concentratore, the "Frue" Vanners and other forms of concentrating devicee, do not warrant the assertion that the "Frue' Vanner is the best ore concentrator in the market. The fact that the "Frues" have improved (corrugated) belts does not militate against the superiority of the "Trinmphs;" for, when desired, they (the "Triumphe") can be mounted with a superior belt known as the "Blasdel" Riffled.

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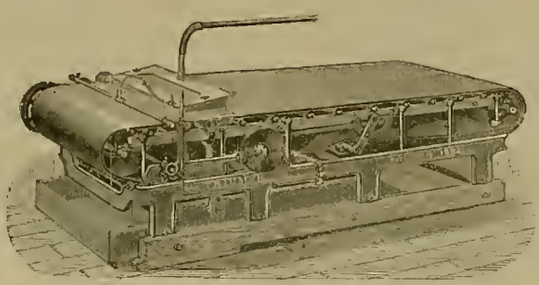
We are prepared to guarantee the superiority of the "Triumph" over the "Frue" or any other form of Concentrator, for coin if need be. Circulars and testimonial letters furnished on application.



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(PATENTED.)

Both the "Triumph" Concentrator and "Blasdel" (riffled) Belt are protected by incontestable letters patent, granted by the Government of the United States.

Original Empire Mill and Mining Company,
Principal Office, 401 California St., cor. Sansome, S. F.
Location of Works, Grass Valley, Nevada Co., Cal.

GRASS VALLEY, NEVADA CO., CAL., Nov. 10, 1885.

Joshua Hendy Machine Works, 39 to 51 Fremont St., S. F., Cal.:

GENTLEMEN—I am pleased to state, in reference to the "Trimmph Ore Concentrators, that four (4) of them were placed in the mill of the Original Emipre Mill and Mining Company in April, 1884, and a thorough test made of their practical oper tion; and their efficiency having been demonstrated, four (4) more were subsequently introduced as the complement of the Twenty (20) Stamp Mill, and the eight (8) have been and are now running with entirely satisfactory results.

At the Ten (10) Stamp Mill of the North Star Mining Company, under my supervision, four (4) are also in successful operation, and from my observation of their practical workings, I am convinced that this form of Concentrators is the equal, if not superior to any other style of Vannors or concentrating devices. DAVID McKAY, JR.,
[Signed] Sup't North Star and Original Empire Mining Co.

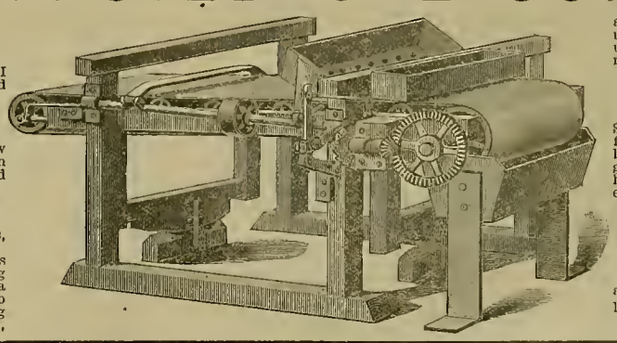
N. B. When the stamping capacity of the two above named mills was increased, more "Trimmph" Concentrators were purchased, and twenty-eight (28) are now in constant successful operation.

TULLOCK IMPROVED ORE CONCENTRATOR.

Patented October 8, 1889, and December, 1890.

ANGELS, CALAVERAS COUNTY, Nov. 22, 1890.
JAMES TULLOCK, ESQ.—Dear Sir: I am pleased to state that I have used two (2) of your Sulphuret Concentrators in the Gold Cliff Mill, since the first day of last May, and that they have given entire and splendid satisfaction, concentrating the sulphurets from 60 tons of ore every 24 hours. Your Sulphuret Concentrators are superior to any that I have seen, being simple in action, positive in effect, admirable in construction, of few mechanical parts, and admirably adapted to the concentration of any kind of sulphurets. I therefore cheerfully recommend them to the mining fraternity. Respectfully yours,
WOODSON GARRARD, Supt. Gold Cliff Minc.

HELENA & IDAHO GOLD MINING CO, SUPERINTENDENT'S OFFICE, GIBBONSVILLE, IDAHO, Oct. 6th, 1890.
MR. JAMES TULLOCK, Angels, Cal.—Dear Sir: Mr. Arnold was saying the other day that you were talking something of coming up this way, and I have thought that perhaps you might be a little uneasy about your concentrators. You need have no anxiety about them whatever, as the one we set up is running all right and has not given a minute's trouble since starting,



and the other one is all ready to start. They were so easy to set up and run that I forgot all about the "letter of instructions" until they were set up and running and you recalled to my mind your letter and instructions. Yours truly,
MYRON K. RODGERS, Supt.

ANGELS, CALAVERAS CO., Nov. 22, 1890.
JAMES TULLOCK, ESQ.—Dear Sir: We have used two of your Sulphuret Concentrators in the Madison Mill, (10) ten stamps, for over six months last past, and I hereby testify that they have given every satisfaction, and in every sense fulfilled the great opinion I had formed of their superiority. They are easily handled, readily kept in order, require but little watching, are exceedingly simple in construction and absolutely positive in their work. In my opinion, they are superior to any other in the market, doing effective work in the treatment of large quantities of sands. Sincerely yours, T. M. LANE,
Supt. Madison Mine.

Price, $350, delivered at Factory, Angels, Calaveras Co., or at Milton railroad station free of charge. For further particulars, address

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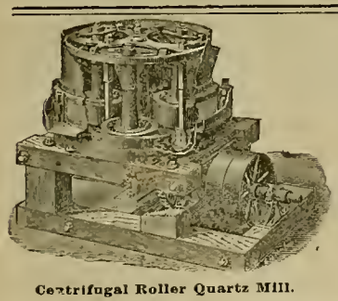

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